

(11) ANON: World action on smoking. Brit Med J 4: 65, 1971

Carbon monoxide may be a toxic ingredient of tobacco smoke that deserves more attention than it has received. P. Astrup¹ has recently reported that exposure of rabbits to low concentrations of carbon monoxide can lead to production of atheroma. The carboxyhaemoglobin content of the blood of cigarette smokers may exceed 10%, and Astrup believes that this may be more important than nicotine in relation to coronary disease. Further research on this aspect is certainly needed.

There are two statements that should be modified. Astrup's experiments were performed on rabbits fed with cholesterol and their blood levels showed 15% carboxyhemoglobin (see page 69). That the blood levels of smokers may exceed 10% is a rarity (see pages 20-21).

1005051209

(12) ANON : Cigarette smoking and carbon monoxide. Med Letter Drug Ther
13: 91-2, 1971.

In addition to nicotine, tars, and other chemical compounds, carbon monoxide has been incriminated as a pathogenic factor in cigarette smoke. Recent studies have suggested that heavy cigarette smoking (more than 20 cigarettes a day) may result in an intake of carbon monoxide that could impair the performance of the smoker in driving a car or piloting an airplane.

The average concentration of carbon monoxide in cigarette smoke is about 20,000 parts per million or about 400 ppm in the inhaled mixture of smoke and air (J. R. Goldsmith and S. A. Landaw, *Science*, 162:1352, 1968). The additive effects of carbon-monoxide-polluted air must also be taken into account. In Los Angeles, where high atmospheric carbon monoxide levels have caused concern, the concentration in the air during a four-year study ranged from 7.3 to 20.2 ppm (A. C. Hexter and J. R. Goldsmith, *Science*, 172:265, 1971).

The reference to the paper by Goldsmith and Landaw (1968) regarding 400 ppm of an inhaled mixture of smoke and air appears in this article. Since Goldsmith and Landaw cite no reference, it is not possible to challenge their source. Jongbloed (1939) analyzed the alveolar air and noted a peak level of 31.5 ppm carbon monoxide. Ringold et al (1962) analyzed the expired air after a 20-second breath-holding period and noted a level of 16.4 ppm for heavy smokers (see page 19).

1005051210

- (13) ARONOW W S, KAPLAN M A and JACOB D : Tobacco: A precipitating factor in angina pectoris. Ann Int Med 69: 529-36, 1938.
- (14) ARONOW W S, DENDINGER J and ROKAW S N : Heart rate and carbon monoxide level after smoking high-, low-, and non-nicotine cigarettes. A study in male patients with angina pectoris. Ann Int Med 74: 697-702, 1971.
- (15) ARONOW W S and ROKAW S N : Nonnicotine cigarettes. Effects in angina pectoris. Circulation 44: 782-8, 1971.
- (16) ARONOW W S, HARRIS C N, ISBELL M W, ROKAW S N and IMPARATO B : Effect of freeway travel on angina pectoris. Ann Int Med 77: 669-76, 1972.

These four publications from Aronow's group have been widely quoted as supporting the theory that carbon monoxide causes coronary heart disease. It should be noted that the investigation concerns carbon monoxide contained in cigarette smoke and in vehicular exhaust. There is no comparative study using carbon monoxide in air to ascertain that the results are due to carbon monoxide contained in vehicular exhaust or cigarette smoke.

Not all four reports include blood analysis for carboxyhemoglobin. In the first, none is recorded, in the second, blood was analysed, in the third, alveolar-expired air was used, and in the fourth, both blood and air had analysis.

1005051211

- (17) AYRES S M, GIANNELLI S Jr and MUELLER H : Myocardial and systemic responses to carboxyhemoglobin. Ann NY Acad Sci 174: 268-93, 1970.
- (18) AYRES S M, MUELLER H S, GREGORY J J, GIANNELLI S Jr and PENNY J L : Systemic and myocardial hemodynamic responses to relatively small concentrations of carboxyhemoglobin (COHb). Arch Environ Health 18: 699-709, 1969.

These 2 papers have been widely quoted as important evidence of the role of carbon monoxide in causation of coronary heart disease. It is important to examine the methods used which have a basic fault, viz, inhalation of 5% carbon monoxide, producing blood levels of 9%. Other investigators have attained 50% to 90% carboxyhemoglobin levels with inhalation of 5% carbon monoxide. The blood samples were drawn by Ayres et al 10 minutes after starting the inhalations, which means that the blood had not reached equilibrium with the alveolar air. The observations by Ayres et al were on a nonsteady state. It is customary to measure coronary blood flow and myocardial metabolism during a steady state of at least 10 minutes.

Methods

Studies were performed on 26 patients during routine diagnostic cardiac catheterization and in 31 dogs. The patients were studied in a cardiopulmonary laboratory following completion of diagnostic procedures. Catheters were placed in the ascending aorta and pulmonary artery. A Gerdale-Rubin catheter was placed in the proximal coronary sinus in 11 of the human studies and in 16 of the canine studies. Mixed expired air, arterial, mixed venous and coronary sinus blood was obtained prior to administration of carbon monoxide. The subject was then switched to a mixture of 5% carbon monoxide in air for from 30 to 120 seconds, with continued electrocardiographic monitoring. Following a ten-minute period to permit washout of alveolar carbon monoxide, repeat blood samples and mixed expired air were collected while breathing room air. Coronary blood flow was measured immediately before and ten minutes after carbon monoxide breathing.

The carboxyhemoglobin levels after exposure to 0.01% to 1.0% is as follows:

TABLE 1
CORRELATIONS OF ATMOSPHERIC CARBON MONOXIDE EXPOSURE AND CARBOXYHEMOGLOBIN

CO IN AIR (PER CENT)	DURATION OF EXPOSURE (80% EQUILIBRIUM)	COHb (PER CENT OF BLOOD-CO SATURATION)
*0.01 (100 ppm)	6 or more hours	17
0.02 to 0.03	5 to 6 hours	23 to 30
0.04 to 0.06	4 to 5 hours	36 to 44
**0.1 (1000 ppm)	3 or more hours	50
0.2	1 hour	55 to 60
0.3	30 minutes	50
0.4	20 to 30 minutes	68
0.5 to 1.0	2 to 15 minutes	75

*An atmospheric CO concentration of 0.01% leads to COHb saturation of 17%, no matter how long the exposure.

**An atmospheric CO concentration of 0.1% leads to a COHb saturation of 50%, no matter how long the exposure. One half of the available hemoglobin will be converted to COHb, and half will remain available for combination with oxygen, for at this point an equilibrium in the blood is reached according to the law of mass action.

1005051212

- (19) AYRES S M: Roles of carbon monoxide and nicotine in circulatory effects of cigarette smoke. JAMA 219: 520, 1972.

Roles of Carbon Monoxide and Nicotine in Circulatory Effects of Cigarette Smoke

Q I would like information about the specific factors that cause cigarette smoking to have an adverse effect on the cardiovascular system. Is it only nicotine that is involved, or can carbon monoxide and its effect on carboxyhemoglobin levels be implicated?

ARTHUR H. SCHLES, MD
New Rochelle, NY

A Until recently, the pharmacology of tobacco smoke was thought to be essentially that of nicotine, and most early articles on the toxicity of cigarette smoke emphasized nicotine to the exclusion of other considerations. It seems likely, however, that the 3% to 4% of carbon monoxide found in cigarette smoke may play an important role intensifying the recognized cardiovascular toxicity of nicotine. Carboxyhemoglobin levels as low as 3% to 4% may increase the oxygen debt of exercise¹ and we have shown that levels of carboxyhemoglobin between five and ten percent may produce abnormal myocardial metabolism in patients with coronary artery disease. Smokers generally have 3% to 7% of their hemoglobin saturated with carbon monoxide. The whole subject has been recently reviewed in a New York Academy of Science monograph on carbon monoxide² and in the progress reports from the Surgeon General's office on cigarette smoking and health.

The toxicity of tobacco smoke appears to derive from both its nicotine and carbon monoxide content. Nicotine increases cardiac work by increasing heart rate and blood pressure. Carbon monoxide interferes with the ability of the heart to extract oxygen from the perfusing blood. The combination of increased oxygen requirements and decreased oxygen availability may well lead to myocardial ischemia, particularly in patients with coronary artery disease.

SIMON M. AYRES, MD
St. Vincent's Hospital
and Medical Center
New York

1. Chevalier RB, Krumholz RA, Ross JC: Effects of carbon monoxide inhalation on the cardiopulmonary responses of non-smokers to exercise. *J Lab Clin Med* 62:167, 1963.

2. Colburn RF (ed): *Biological Effects of Carbon Monoxide*. New York, New York Academy of Science, 1970.

1005051213

Commentary (19) Ayres Cont.

The author cites Chevalier *et al*, a reference which appeared in 1963 as an abstract and does not contain results of blood levels of carboxyhemoglobin. In a subsequent paper (*JAMA* 198: 1061-64, 1966) Chevalier *et al* reported the results of inhaling 0.15% carbon monoxide, which caused a carboxyhemoglobin level of 3.95%. This value is lower than results of others, who obtained levels of 10% to 15% of carboxyhemoglobin. Chevalier *et al* used an indirect technique based on analysis of alveolar air, so that it is possible that by this technique they underestimated the true value if blood analysis was used. The technique employed was as follows:

For determination of COHb levels in the blood, the relationship of Haldane and Smith was used.⁶ Forster and co-workers,⁷ adapted the Haldane relationship for determination of COHb by using a modification of Sjöstrand⁷ in which alveolar gas is equilibrated with pulmonary blood and the equilibrated capillary carbon monoxide tension is measured directly in a sample of expired alveolar gas. This method, as utilized by Forster and co-workers,⁷ gave results in the same range as those found by analysis of whole venous blood for COHb. Our technique for equilibration of capillary carbon monoxide tension was similar to that described above with certain modifications.^{8,9} The Haldane relation states the following (atm signifies atmosphere):

$$\text{COHb/O.Hb} = \frac{210 \text{ CO pressure in atm}}{100 \text{ O}_2 \text{ pressure in atm}}$$

$$\% \text{ COHb} = \frac{\text{O}_2 \text{ pressure in atm}}{210 \text{ CO pressure in atm}} + 1$$

When there is little reduced hemoglobin present, 210 is the M fraction established by Haldane. This technique for determination of COHb showed a satisfactory relationship when compared with the COHb level as determined spectrophotometrically on the venous blood of nine control subjects.

1005051214

- (20) BANYAI A L: Ominous mesalliance: Inhalation of carbon monoxide from motor vehicles and cigarettes. Chest 58: 532, 1970.

One hundred million motor vehicles driven currently in the United States and well over 500 billion cigarettes smoked in this country annually represent a vicious combination of machine-made and self-inflicted air pollution. Most frequent victims of this nationwide health hazard are heavy smokers accustomed to driving a car or other motor vehicle as part of their daily design for living. High temperature and humidity of the atmosphere aid rapid uptake of carbon monoxide by hemoglobin. Also, hyperventilation increases carbon monoxide uptake and decreases its removal from the blood. In subjects with emphysema, absorption of carbon monoxide is reduced because not all of the tidal air is reaching the pulmonary capillaries. In urban population, normal blood contains a small amount of carbon monoxide: 0.62-1.24 percent as carboxyhemoglobin. The affinity of hemoglobin for carbon monoxide is 250 times greater than for oxygen. Relative to the cardiovascular system, it has been noted in experimental animals that exposure to toxic concentrations of carbon monoxide brings about progressive increase in the pulmonary artery pressure, increased heart rate and systolic pressure, together with decreased metabolism. Blood pressure decreases when carboxyhemoglobin values of the blood reach 10 percent. Moreover, intermittent exposure to toxic amounts of or actual poisoning with carbon monoxide may be associated with reversible inversion of T wave, elevation of R-T segment, atrioventricular dissociation and A-V block. These changes, as well as associated degenerative sequelae in some of the myocardial fibers, small hemorrhages in and necrosis of the myocardium resemble closely alterations due to severe hypoxia from other causes. In humans suffering from coronary heart disease, the extraction of oxygen from the blood by the myocardium is reduced at carboxyhemoglobin levels between 5 and 12 percent. This phenomenon may be a contributory factor to the increased incidence of angina pectoris and coronary thrombosis in the individuals involved. Another adverse result of carbon monoxide is increased viscosity of the blood. Rabbits inhaling 0.017 percent carbon monoxide in air for several weeks develop atherosclerosis and myocardial necrosis. Atheromatous changes are pronounced in cholesterol-fed animals inhaling low concentrations of carbon monoxide as compared with cholesterol-fed animals without exposure to carbon monoxide. Astump et al (Conference on Biologic Effects of Carbon Monoxide, New York Acad Med, 1969) observed in animal experiments that carbon monoxide rendered vessel walls more permeable, with consequent increased flow and deposition of fat in vessel walls and development of atherosclerosis. Observations in humans show that low concentration of carbon monoxide may lead to inhibition of bioelectric activity of the brain. Impairment in cognitive and psychomotor areas of the brain may be associated with carboxyhemoglobin levels between 2 and 5 percent. In the lung, hypoxia caused by carbon monoxide inhibits the function of alveolar macrophages. This, in turn, weakens tissue defense against airborne bacterial infection. An appropos question may be posed: if the recurrent or sustained hypoxic state of the lung tissue might not favor development of bronchogenic carcinoma under the influence of carcinogens of cigarette smoke. One hundred million

1005051215

Commentary (20) Banyai, Cont.

motor vehicles discharge 66 million tons of carbon monoxide annually. No wonder that in all major cities at busy intersections during hours of peak traffic the concentration of this harmful gas is much higher than the maximum allowable concentration, victimizing drivers, pedestrians and traffic policemen. Carbon monoxide in cigarette smoke is an incomplete combustion product even though the temperature at the burning zone of the cigarette is 884°C (1,635.2°F) while air is being drawn through the cigarette. Carboxyhemoglobin level of the blood is 4-6 percent in moderate smokers and up to 12 percent in heavy smokers. Its potential hazard can be estimated by adding these figures to those pertaining to motor vehicle drivers.

Andrew L. Banyai, M.D.

a. If hyperventilation increases carbon monoxide uptake, it will also hasten its removal from the blood. One technique for promoting the elimination of carbon monoxide in acute poisoning is to increase depth of respiration by having the patient inhale 5% carbon dioxide in oxygen.

b. In urban populations, the carboxyhemoglobin level in the blood is greater than 0.62% to 1.24%. In the 25 investigations reported in the literature the overall mean for 1,662 subjects was 1.45%. Residents of London, Los Angeles and Milan show the following mean levels respectively: 3.5%, 2.3% and 2.8%. These values represent a significant contribution by carbon monoxide to pollution in the atmosphere (see pages 32 and 33).

c. The effects listed in 15 lines are derived from toxic concentrations of carboxyhemoglobin ranging from 50% to 100%. The phrase "toxic concentration" appear only in the first sentence but applies to the next 3 sentences.

d. The experiments in rabbits fed with cholesterol are not supported by those in dogs reported by De Bias *et al* (1972). Chronic exposure to carbon monoxide does not exaggerate myocardial ischemia (see page 62).

e. There is no published report that psychomotor and cognitive areas in the brain can be influenced by levels of carboxyhemoglobin between 2% and 5%. More accurate statistics would be between 5% and 20% (see pages 88-89).

f. The effect of carbon monoxide on alveolar macrophages of experimental animals is encountered with levels of 0.5% to 2% in inspired air. Smokers have a level of carbon monoxide of 7 to 12 ppm in expired air, which is 1000 less than the concentration used in experiments on animals.

g. The levels of 4% to 6% carboxyhemoglobin in moderate smokers and 12% in heavy smokers is not supported by values stated in the literature. Balbo *et al* (1966) reported a mean level of 2.8% for 7 smokers, each consuming 30 cigarettes daily. Rouch *et al* (1971) reported a mean of 4.25% for 15 smokers using more than 10 cigarettes daily (see page 15).

1005051216

- (21) BARTLETT D Jr: Pathophysiology of exposure to low concentrations of carbon monoxide. Arch Environ Health 16: 719-27, 1968.

Regular cigarette smokers have repeatedly been shown to have COHb concentrations in the 5% to 10% range.²⁷ Smokers of pipes and cigars have COHb levels that are somewhat lower than those of cigarette smokers, but higher than those of nonsmokers. These findings have led to the widespread error of supposing that smokers may be more susceptible to environmental CO than nonsmokers. Carbon monoxide from cigarette smoke and CO in the ambient air are not additive in their biologic effect. Carbon monoxide is absorbed only when the Pco in the ambient air exceeds that in the pulmonary capillary blood. Thus, persons with COHb levels of 5% from smoking do not absorb further CO from the environment unless the ambient CO concentration is 30 ppm or more; on the contrary, they excrete CO at a rate roughly proportional to the Pco gradient between their blood and the ambient air. This suggests that smokers may be among the least susceptible of persons exposed to low atmospheric concentrations of CO, since their COHb concentrations are not increased by the exposure. This conclusion is modified, however, by the fact that smokers' CO excretion between cigarettes is slower in a CO-polluted environment than in pure air. Thus, their long-term average COHb concentrations are slightly higher in the presence of environmental CO than in its absence.

The death rate from coronary heart disease is considerably higher for smokers than for nonsmokers.²⁷ The rate for exsmokers is no higher than for persons who have never smoked. This pattern implies that the smoking effect is completely reversible when an individual stops smoking. Thus, smoking must cause myocardial hypoxia by some acute, reversible process, probably unrelated to the formation of hard, irreversible, atherosclerotic lesions. Carbon monoxide fits this epidemiologic pattern quite well, but nicotine or other components of cigarette smoke may be responsible, and the question remains unsolved.

The two paragraphs quoted from this article emphasize two points: (1) Carbon monoxide from cigarette smoke and that in the ambient air are not additive in their biologic effect; and (2) the effect of smoking on coronary heart disease is reversible. These two points were missed in the main text of this review and their conception properly belongs to Bartlett.

1005051217

(22) CAMM A J : The effects of smoking. Guy Hosp Gaz 81: 185-203, 1967.

Some three hundred different constituents of tobacco smoke have been identified, many of them in infinitesimally small quantities. The two substances present in the greatest amounts are carbon monoxide and nicotine. Although carbon monoxide is found in high proportions in the mainstream smoke of a cigarette, it is seldom found in high proportions combined with haemoglobin in the blood. The percentage of carboxy-haemoglobin rarely rises above five per cent unless cigarettes are "chain-smoked" in which case it may rise to ten per cent. This is not sufficient to be of clinical significance.

This review article includes a section on "contents of tobacco smoke". The paragraph quoted summarizes the present status of carboxyhemoglobin levels in cigarette smokers, concluding with the statement: "This is not sufficient to be of clinical significance".

1005051218

- (23) CONROY J P : Smoking and the anesthetic risk. Anest Anal 48: 388-400, 1959.

It takes 24 hours in a carbon monoxide free atmosphere to reduce a carboxyhemoglobin of 18 to 5 percent.¹¹ Is it extravagant to demand 72 smoking-free hours before anesthesia?

The 24 hours required to reduce carboxyhemoglobin in the blood from 18% does not apply to the time required to reduce from 5% the blood level of carboxyhemoglobin in cigarette smokers. In the literature, 4 to 12 hours after smoking, the mean blood level for 2,054 habitual smokers is 3.76%. This value, compared with the level for nonsmokers, represents an increase of 2.19% attributed to smoking. Because of endogenous and exogenous sources of carbon monoxide other than cigarette smoking, it is not possible to reduce the carboxyhemoglobin level below 1.5% (see pages 12-13). An answer to the question raised by Conroy should be as follows: Waiting 72 hours is unreasonable; 4 to 12 hours would be sufficient.

1005051219

- (24) CURPHEY T J : Carboxyhemoglobin in relation to smoking. Nat Cancer Inst Monogr 28: 231-5, 1968.

This is an excellent discussion of the significance of the carboxyhemoglobin level in relation to smoking. The entire article is reproduced.

Carboxyhemoglobin in Relation to Smoking

THEODORE J. CURPHEY, M.D.,¹ *Chief Medical Examiner—Coroner, Los Angeles County, Los Angeles, California 90012*

THE main thrust of the Conference and the tenor of discussion in the general sessions and in this workshop have been to review and analyze the various agents in tobacco smoke with regard to their potential threat to the health and well-being of the cigarette smoker. The evidence already presented has dealt largely with those effects of certain components of tobacco smoke as they relate to such problems as myocardial infarction, blood coagulation, and carcinogenesis. What can be done to reduce such hazards as "tar" and nicotine, thus leading to the production of a less harmful cigarette, has been discussed.

This afternoon's workshop seems to me to be a variation on the general theme, being in the nature of a movement written in a minor key. It has dealt with certain components in tobacco smoke, e.g., nicotine, whose deleterious properties have not been experimentally and clinically established, but which are nevertheless under various degrees of suspicion. Therefore, these components must be examined in the process of writing the score for the orchestration of Dr. Wynder's symphony, entitled *Toward a Less Harmful Cigarette*.

Carbon monoxide (CO) is one of these components of tobacco smoke that has long been suspected of being harmful and, hence, has received much study over the years.

The problem of CO as a harmful constituent of tobacco smoke raises two questions:

1. Does the amount of CO in the blood differ between the smoker and nonsmoker?
2. If more CO is present in the blood of the smoker, does it produce either functional or structural pathological changes? Are such changes demonstrable by symptomatic, clinical, or laboratory evidence, and can they therefore be assumed to be detrimental to the health or well-being of the smoker as is true in the case of other components of tobacco smoke?

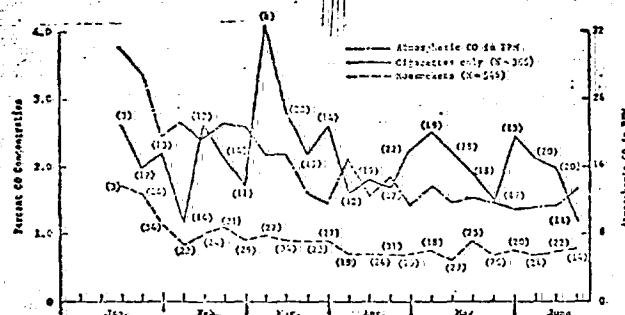
There is abundant evidence in the literature to answer unequivocally the question of the difference between the CO blood level concentration in the smoker and nonsmoker. The article by Larson *et al.* (1) is replete with references covering studies over the past 50 years of CO blood levels in smokers and nonsmokers under various conditions, as well as the effect of various quantity levels of smoking on the CO blood level.

Numerous studies on the normal blood level of CO in the nonsmoker show ranges from 0.5-2.8%. In our study, we used 1% as the normal level.

1005051220

Commentary (24) Curphey, Cont.

The data to be presented on the amount of CO in the blood of smokers are a good example of serendipity. Originally our study was aimed at determining whether there was any correlation between the postmortem CO blood levels of individuals handled by the Los Angeles County Medical Examiner's Office and the CO level of the ambient air at the time of death. We were not considering the cause or mode of death, but were looking for a way to use the CO blood level as a daily indicator of air pollution in the Los Angeles basin (text-fig. 1).



TEXT-FIGURE 1.—Distribution median of CO in blood of cigarette-only smokers and nonsmokers.

After analyzing our data, we observed a significant association, which, however, was not noted for every location of the monitoring station. Goldsmith *et al.* (2) who had studied the blood CO levels of longshoremen in San Francisco in relation to their smoking habits suggested that the collected data be used to study the smoking habits of this postmortem population.

From November 1-June 30, 1961, 2,267 cases were surveyed, and the data were correlated with 1) the CO concentration of the ambient air at certain monitoring stations in Los Angeles and 2) the smoking habits of the study group (2). To determine the smoking habits of the group, a questionnaire was mailed to the next of kin, when known, or to a known informant. This reduced the group to a total of 1,578 persons, from whom we received usable smoking histories for 1,073 persons.

The 1,073 persons were divided into two groups: 1) nonsmokers (including ex-smokers and persons who never smoked), and 2) smokers. These two groups were further subdivided into (a) those under age 65 and (b) those over age 65. The blood CO levels in the entire group ranged from 0-11.0%. Over 89% of the nonsmokers, regardless of age, fell in the 1% or less CO level. A blood CO level of 5%, regardless of smoking habit, was considered abnormally high.

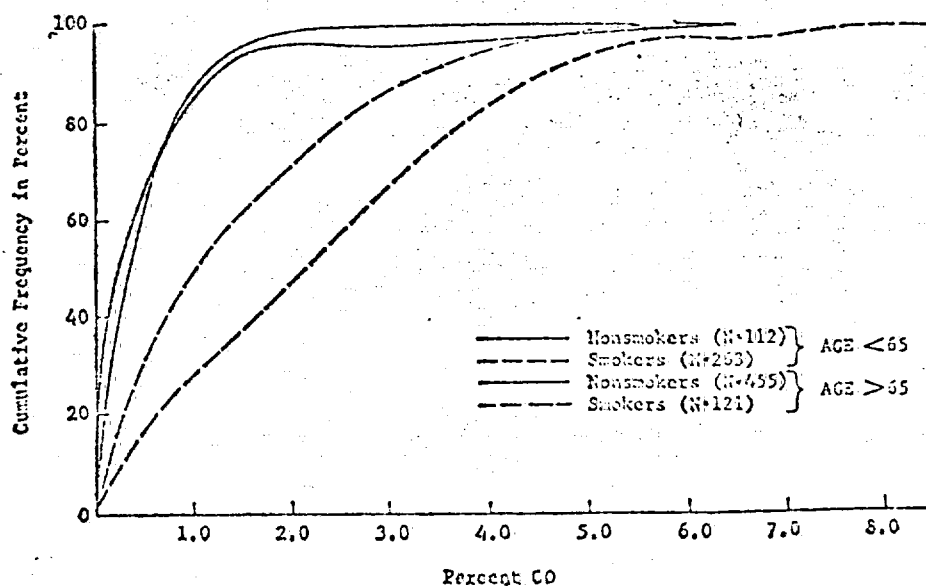
Forty-six persons had values of 5% and all of these were smokers, except 3 who were ex-smokers. Only 7 of the 46 persons were age 65 or over; in other words, 85% of the persons were in the younger age group. Furthermore, with the use of 1% CO as the normal blood level for nonsmokers, 62% of the nonsmokers had less than this level, whereas only 22% of the smokers had values this low (text-fig. 2). Also, the smokers tended to have a much greater frequency at the extreme values of more than 4%. Moreover, smokers over 65 years old had almost twice as high a percentage value under 1% as the smokers under 65 years (text-fig. 2). The interpretation of this finding offers room for speculation, with one possibility being that older smokers might smoke less than their younger counterparts.

1005051221

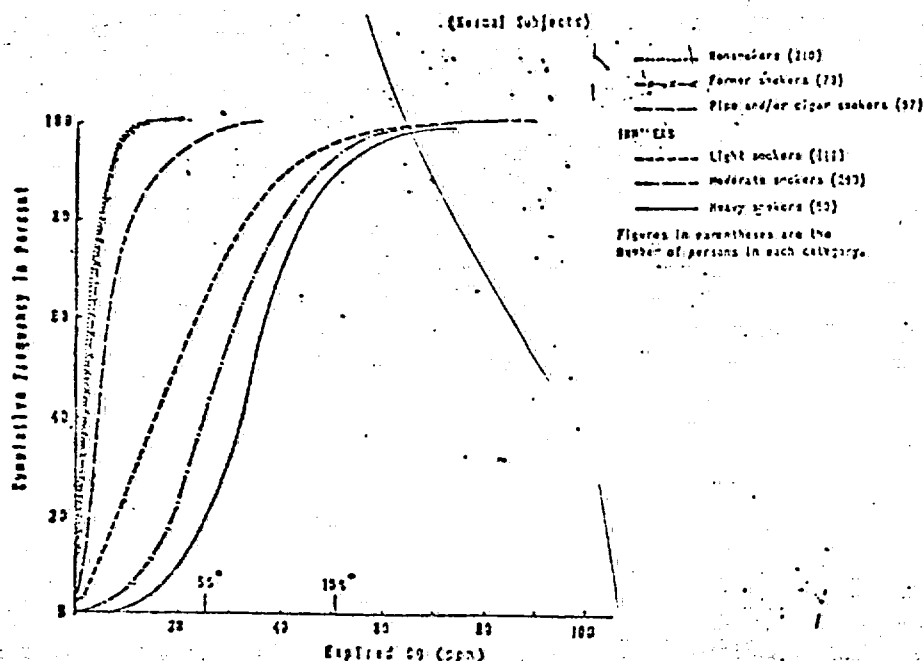
Commentary (24) Curphey, Cont.

Another interesting fact gleaned from a study of the observed median CO values is that the values of male nonsmokers were greater than those of female nonsmokers by a factor of nearly 2. On the other hand, for smokers, the distribution by sex did not show consistent differences.

That there is a direct correlation between the height of the CO blood level and the number of cigarettes smoked is a well-established fact, as demonstrated by Goldsmith (2) in his study of a group of San Francisco longshoremen (text-fig. 3). This is seen in the graph of percentage cumulative frequency of expired CO measured in ppm as related to the smoking habits of his study group.



TEXT-FIGURE 2.—Percentage cumulative frequency and percentage of blood CO in smokers and nonsmokers.



TEXT-FIGURE 3.—Distribution of expired CO in longshoremen, by smoking pattern: ILWU study, 1961. *Percent carboxyhemoglobin concentration based on regression: $\text{COHb}\% = 0.21 + 0.19 \times (\text{CO ppm})$.

1005051222

Commentary (24) Curphey, Cont.

The graphs of Goldsmith's cases of live persons and of our cases show very good correlation in the CO expressed in ppm of expired air with that obtained from a study of postmortem blood expressed in percentage terms of carboxyhemoglobin concentration.

Goldsmith did not correlate the CO blood levels with the general health of his subjects; and obviously in our series, we were denied that opportunity, since the deaths we studied included those from natural causes due to disease and also homicidal, suicidal, and accidental deaths. In point of fact neither of these studies answers the question "Is smoking dangerous to health?"

Fortunately, there is good evidence available which bridges this gap, namely, the study made by Sievers *et al.* (4) of the effect of exposure to known concentrations of CO on a group of 156 police traffic officers, between 32 and 51 years old, who were assigned to duty in the Holland Tunnel for a period of 13 years. These officers were exposed to an average of 70 ppm of CO, which is equivalent to 10% (COHb saturation), with brief exposures up to 260-300 ppm at times and with the heaviest level for a 24-hour period of 66 ppm (14% COHb). Infrequently, the CO level exceeded 260 ppm (32% COHb) and rarely rose as high as 300 ppm (40% COHb) for a few minutes at a time.

This study on police traffic officers is particularly valuable for the purpose of this workshop, for it demonstrated that these men showed no evidence of injury to their health, as determined by serial physical examinations, blood and urine studies, EKG tracings, blood pressure readings, and neurological examinations. In this latter connection, an excellent test for judging the integrity of the nervous system was the pistol marksmanship record of these officers. The Port Authority pistol team was composed of 7 officers, 6 of whom had tunnel duty, and the team consistently finished in first or second place in formal competition with pistol teams from other police organizations for 7 consecutive years.

Even more pertinent to our charge at this time is the study of the smoking habits of the officers in relation to their blood CO levels. Variation in the entire group ranged from 0.5-13.1% saturation, the highest values being obtained in those who smoked and were stationed on the upgrade section of the tunnel and who were exposed to atmospheric CO readings slightly above 100 ppm (16% COHb saturation) for a 2-hour period in contrast to the average daily value of 70 ppm (10% COHb saturation).

What appears to be the most significant observation in this study of traffic officers in the Holland Tunnel is that the blood CO levels of non-smokers in the tunnel on the average exceeded those of smokers in an environment free from any occupational exposure to CO. Since these men remained healthy after being consistently exposed for 13 years to CO levels appreciably higher than those found in tobacco smoke, the conclusion then is inescapable that smokers with CO levels that lie well within these same ranges are similarly unaffected by CO.

REFERENCES

- (1) LARSON, P. S., HAAQ, H. B., and SILVERSTEIN, H.: Experimental clinical studies. In Tobacco, Baltimore, Williams & Williams Co, 1931, pp 106-110.
- (2) GOLDSMITH, J., SCHULTZ, F., and NOVIK, N.: Appraisal of carbon monoxide exposure from analysis of expired air. In Proceedings of XIV International Congress on Occupational Health, Madrid, September 1963.
- (3) CURPHEY, T. J., HOOB, L. D. L., and PIERINS, N. M.: Carboxyhemoglobin in relation to air pollution and smoking: Postmortem studies. Arch Environ Health (Chicago) 10: 170-167, 1965.
- (4) SIEVERS, R. F., EDWARDS, T. L., MURRAY, A. L., and SCHENK, H. H.: Effect of exposure to known concentrations of carbon monoxide: Study of traffic officers stationed at the Holland Tunnel for 13 years. JAMA 149: 7-8, 1942.

1005051223

(25) DINMAN B D : Carbon monoxide and cigarette smoking. JAMA 212: 1785, 1970.

Although the community is concerned with carbon monoxide body burdens arising from ambient concentrations of this gas, it ignores almost totally the most significant source of carbon monoxide intake—the cigarette. This is paradoxical, since the air of our cities rarely contains more than 30 parts of carbon monoxide per million parts of air (ie, 30 ppm); cigarette smoke streams have been reported to contain from 400 to 40,000 ppm carbon monoxide!

The body itself manufactures carbon monoxide in the course of the breakdown of hemoglobin to the extent of about 1 teaspoonful per day. This small amount of carbon monoxide converts about 0.8% of hemoglobin to inactive carboxyhemoglobin. By contrast, the light smoker converts about 3% of his hemoglobin while the heavy smoker inactivates approximately 8% of this blood pigment. Pipe and cigar smokers rarely achieve such loadings. The body has "learned" to adapt to the small amount of self-produced carbon monoxide over the course of evolution. However, the body burden arising from cigarette smoking probably extends beyond the limit of ready accommodation.

What is the significance of such cigarette-caused carbon monoxide body burdens? It is quite clear that visual acuity at low levels of light intensity is impaired with carbon monoxide loadings in the middle of that range of carboxyhemoglobin levels seen among cigarette smokers. Less clear at this time is the effect of carbon monoxide per se upon cardiac function. However, among patients with heart disease whose ability to accommodate is compromised, at levels of 7% to 9% carboxyhemoglobin, there is deterioration in several cardiac-function indices. On the basis of animal experimental data, it appears that long-term carbon monoxide exposures with about 12% carboxyhemoglobin loading are associated with increased deposition of cholesterol in blood vessels. On the basis

1005051224

Commentary (25) Dinman, Cont.

of epidemiological data, there are some suggestions that this might also apply to humans. In addition, research in mountainous areas suggests that the carbon monoxide loading stemming from cigarette smoking contributes significantly to the development of chronic mountain sickness.

(a) The level of 40,000 ppm carbon monoxide represents pure cigarette smoke which a smoker does not inhale continuously. The concentration of carbon monoxide in the expired air of a heavy smoker is 16.4 ppm and in that of a light smoker 7.7 ppm (see page 19).

(b) The carboxyhemoglobin levels of 3% as estimated for a light smoker and 8% for a heavy smoker are not supported by the available results of investigations. Balbo et al (1966) reported a mean level of 2.8% for 7 smokers consuming 30 cigarettes daily. Rouch et al (1971) recorded a mean level of 4.25% for 15 smokers using more than 10 cigarettes daily (see page 15).

(c) The investigation quoted refers probably to Aronow et al (1971), who noted a reduction in exercise tolerance when patients with angina pectoris smoked low-nicotine cigarettes. The carboxyhemoglobin blood level is elevated to 7.79% but a cause-and-effect relationship has not been demonstrated (see page 62).

(d) The cited work on cholesterol deposition involves rabbits fed with cholesterol in the diet. In dogs, chronically exposed to 100 ppm carbon monoxide, De Bias et al (1972) failed to exaggerate the signs of myocardial ischemia. There is no experimental support for the statement that a blood level of 10% carboxyhemoglobin is harmful to the ischemic heart (see page 62).

1005051225

- (26) DOYLE J T : Smoking and myocardial infarction. Circulation 39 & 40:
Suppl 4: 136-43, 1969.

This review contains a paragraph on the role of carbon monoxide in pathogenesis of atherosclerosis. The author views the problem in the proper perspective.

The manner in which cigarette smoking accelerates atherosclerosis and its complications is, in short, unexplained. It is possible that in some way cigarette smoking damages the arterial intima. Carbon monoxide is the likeliest immediate candidate for such a role. Some presently mysterious interference with the normal mechanism of transport of lipids from the plasma through the vascular tunics to the lymphatics secondary to the inhalation of cigarette smoke is an alternative possibility. In all populations yet scrutinized, the prevalence and incidence of CHD rise with the serum cholesterol concentration.²² It is, accordingly, a plausible hypothesis that inordinate cigarette smoking may be associated with an increased serum cholesterol concentration. Such a relationship does, indeed, exist, but is unimpressive. Although the serum cholesterol concentration in both men and women is consistently higher in cigarette smokers, the influence of increasing age is substantially greater (figs. 1 and 2).²³ The observation that heavy cigarette smokers have far more atheroma than nonsmokers is, possibly, complemented by Astrup's observation that fat-fed rabbits exposed to high tensions of carbon monoxide exhibit extreme hyperlipidemia and cholesterolemia as compared to controls not exposed to carbon monoxide.²⁴⁻²⁶ This interesting experimental model has, however, no recognized counterpart in human epidemiological studies. Obesity as a coronary risk factor is not related to cigarette smoking.² Lastly, the arterial blood pressure is not associated with cigarette habit.²

1005051226

(27) GIEL B G : Air pollution and your lungs. Public Health News 46: 246-53, 1965.

FACTS ABOUT SPECIFIC AIR POLLUTANTS

Carbon Monoxide

Carbon monoxide is well known to all of us. Yet many smokers are unaware that approximately seven to eight percent of their hemoglobin may be bound as carboxyhemoglobin. If in the mean time, such an individual should develop vascular insufficiency to vital organs, and then be forced to breath ambient air containing 30 ppm of CO for four to six hours or gotten into an atmosphere where he would be exposed to 120 ppm CO for one hour, he would bind an additional five percent of his hemoglobin and could suffer tragic results.

The figure of 7% to 8% carboxyhemoglobin among smokers is an over-estimation. A review of the literature shows an overall mean of 3.76% for 2,054 smokers 4 to 12 hours after smoking, and a peak level of 5.26% after smoking (see pages 12 to 14 and 20 to 21).

1005051227

- (28) GOLDSMITH J R : Carbon monoxide and coronary heart disease. Ann Int Med 71: 199-201, 1969.

A list of future investigations relating to carbon monoxide is included in this Editorial.

The completed jigsaw puzzle may give a clear picture showing that the role of smoking in atherosclerotic diseases is mediated in part by carbon monoxide through such mechanisms as those in the preceding paragraph. Missing pieces are needed: [1] the effects of carbon monoxide exposure with and without vasoactive agents on production of anginal symptoms with exercise; [2] prognostic importance of carboxy-hemoglobin levels over both short and long periods of time in cardiovascular diseases; [3] mechanisms and significance of altered hemoglobin binding of oxygen with age, smoking, and other factors; and [4] the possibility of prevention of cardiovascular effects of cigarette smoking when such smoking does not lead to carbon monoxide absorption.

1005051228

- (29) GOLDSMITH J R : Carbon monoxide and coronary heart disease: Compelling evidence in angina pectoris. Ann Int Med 77: 808-10, 1972.

This Editorial is devoted largely to the investigations of Aronow. The 2 paragraphs reproduced herewith contain suggestions for future investigations which have not been discussed elsewhere in this review.

We still lack decisive epidemiologic evidence that there is a risk of more rapid development of coronary heart disease in cigarette smokers with high carbon-monoxide uptake, compared with those of the same age and smoking habits but with low carbon-monoxide uptake. We do, however, have convincing evidence that the death rates from coronary heart disease are higher in cigarette smokers than in non-smokers (6). The 1972 Surgeon General's smoking and health report says, "Experimental and epidemiological investigations implicate the elevation of carboxyhemoglobin levels in smokers as a contributor to the development of CHD and arteriosclerotic peripheral vascular disease." If one estimates the number of excess deaths caused by arteriosclerotic heart disease in smokers in comparison with deaths of people of the same age and sex who are nonsmokers, the potential for prevention is vast. Of the approximately 580,000 deaths in the U.S. caused by arteriosclerotic heart disease, cigarette smoking makes the greatest proportionate contribution to the deaths of those under 60 years of age, doubling the mortality ratios in several studies. If we can substantially reduce this toll of death and of associated disability by reducing carbon monoxide exposure, it would be a massive public health achievement. We are challenged to develop an alteration in cigarette-smoking behavior that does not permit an increase in carboxyhemoglobin to occur.

It is conceivable that with a cigarette that has a catalytic filter or in which the combustion processes are altered there would be less uptake of carbon monoxide by the smoker. Possibly an alteration in the type of tobacco used would have such effects. Difference in tobacco type is credited with the differential effect of smoking cigars or pipes. Smoking these produces relatively little increase in carboxyhemoglobin compared with that from cigarettes. Although much attention is given to cigarettes that are low in tar and nicotine, practically no attention has so far been given to the public health importance of cigarette smoking that produces a low output of carbon monoxide. Such attention is urgently indicated by the evidence that even small increases in carboxyhemoglobin, as we used to think of them, can decrease the work capacity of persons with angina pectoris.

1005051229

- (30) GOLDSTEIN R E and EPSTEIN S E : Medical management of patients with angina pectoris. Prog Cardiovas Dis 14: 360-98; 1972.

Cigarette Smoking

Patients with angina who smoke a single cigarette before exercise experience significant decreases in the duration of exercise required to precipitate ischemic pain.³¹ The decreased exercise capacity after cigarette smoking is associated with a greater heart rate and blood pressure both at rest and after equal amounts of exercise. Since the pressure-rate product was the same at angina before and after smoking, Aronow and Kaplan concluded that smoking increased MVO₂ during exercise, thus precipitating ischemic pain sooner without appreciably altering myocardial oxygen delivery. These authors attributed the alteration in circulatory response to exercise to ganglionic stimulation by nicotine, although subsequent studies³² using low-nicotine cigarettes yielded the same results as those using ordinary cigarettes. Cigarette smoking might also impair myocardial oxygen delivery in some individuals by converting hemoglobin to carboxyhemoglobin, a change which impairs or destroys the ability of hemoglobin to convey oxygen to tissues. Up to 15% conversion to carboxyhemoglobin can result from heavy smoking.³³

The last sentence quotes Ayres *et al*, which is actually an abstract. The statement that heavy smoking can produce a blood level of 15% carboxyhemoglobin is not based on any experimental observations.

Carboxyhemoglobin (COHB) and the Access to Oxygen: An Example of Human Counter-Evolution

STEPHEN M. AYRES, MD, FACC; STANLEY GIANNELLI, Jr., MD, FACC; HILTRUD MUELLER, MD, New York, New York

Cigarette smoking and exposure to community air pollution produce COHB saturations between 3 and 15% and decrease both oxygen capacity and the unloading tension of circulating hemoglobin. An individual with 15% COHB has regressed to a hemoglobin which is functionally intermediate between that of an elephant and a newborn goat.

Acute studies performed in 26 subjects demonstrated that elevation of COHB levels to an average of 7.96% increased cardiac output from 5.01 to 5.56 liters/min, increased minute ventilation from 6.36 to 8.64 liters/min, and decreased arterial and mixed venous oxygen tension from 81 and 39 to 76 and 31 mm Hg, respectively. Myocardial studies performed by coronary sinus catheterization demonstrated that similar elevations of COHB increased coronary blood flow, decreased coronary artery-coronary sinus oxygen content and decreased coronary sinus oxygen tension. The changes were most marked in patients with coronary artery disease or chronic emphysema. Lactate extraction decreasing in 10 of 15 patients. The possibility of adaptation was studied by achieving similar COHB concentrations with both a low and high concentration of carbon monoxide. Hemodynamic changes appeared more marked with administration of the high concentration even though COHB was the same.

These studies suggest that COHB concentrations between 5 and 10% may produce abnormal myocardial function in certain individuals. The well-known deleterious effect of cigarette smoking on the heart may be explained by the interaction of COHB and nicotine, the latter increasing cardiac work and the former decreasing oxygen availability.

1005051230

- (31) LINDQUIST V A Y : Carbon monoxide: Its relationship to air pollution and cigarette smoking. Public Health London '86: 20-6, 1970.

☞ Cigars and pipe tobacco produce more CO than cigarettes, but cigarette smokers tend to have higher levels of COHb because they usually inhale. The gas phase of cigarette smoke contains 1-3% CO (Osborne *et al.*, 1965; Robinson & Niessen, 1961) and the concentrations tend to be highest as the cigarette is smoked down toward the butt-end. Continuous exposure to such ambient concentrations would normally render a man unconscious in a few minutes. However, inhalation of cigarette smoke is both transient and intermittent and the gas is diluted with atmospheric air so that a single cigarette would not be expected to produce an immediate rise in COHb of more than 3%. During the course of a day, those who smoke heavily and inhale usually have mean COHb concentrations in excess of 4% and may even exceed 10% (Ayres *et al.*, 1965; Goldsmith & Landaw, 1968).

- (a) This is a more accurate summary of carboxyhemoglobin levels in cigarette smokers.

Myocardial Oxygenation

☞ Those organs with high oxygen consumption leave little "reserve" in the blood supplying them and therefore rely more on increased perfusion to meet any extra demand for oxygen. The myocardium is a typical example. A combination of high oxygen demand, poor perfusion, lowered oxygen capacity and impaired oxygen uncoupling from the blood will obviously prejudice tissue respiration. This was classically demonstrated by Ayres *et al.* (1969, 1970). In a group of noncoronary disease patients undergoing cardiac catheterization raising the COHb level to 9.0% produced a significant increase in coronary perfusion. Despite this, however, the oxygen tension of coronary sinus blood, and presumably of the myocardium itself, dropped slightly. After raising the COHb to a similar degree in a group with established coronary disease, the increase in perfusion was less marked and there was definite reversal of lactate and pyruvate extraction in addition to a drop in oxygen extraction. This indicated significant myocardial hypoxia.

- (b) The experiments of Ayres *et al.* (1969, 1970), consisting of inhalation of carbon monoxide causing blood levels of 9.0% are probably in error. This is discussed elsewhere in the present commentary (see page 148).

1005051231

(32) NAHUM L H : Smoking and thrombosis. Conn Med 29: 853-4, 1965.

The next problem is to determine by what mechanism does smoking accelerate thrombosis. Employing the method of multiple working hypotheses, a number of possibilities immediately present themselves. One is that smoking produces an increase in carbon monoxide hemoglobin up to 15-20 per cent which somehow promotes thrombosis. Another is that nicotine absorption itself sets into operation the thrombotic process. A third possibility is the well known effect of nicotine in liberating increased amounts of epinephrine which may be the real culprit in accelerating thrombosis. A fourth possibility is that smoke irritation in the bronchial mucosa liberates into the blood stream a thrombus inducing agent. Perhaps there are other possibilities as yet unidentified.

That cigarette smoking produces an increase in carboxyhemoglobin of up to 15% to 20% is a rarity. In a review of the literature, it was found that out of 30 investigations only Meigs (1948) reported a mean level of 16.2% for a group of 6 habitual smokers. The overall mean level for 2,054 subjects reported in 29 investigations was 3.76% (see page 12).

1005051232

- (33) NAHUM L H: Toxic products in cigarette smoke: pleasure or poison.
Conn Med 32: 154-5, 1963.

Okay, well let's see what it is that the cigarette smoker inhales. Most people when they consider air pollution think of the automobile, the smoke-stack or the trash burners. It's time then to point to a most damaging source of air pollution, the cigarette. One of the toxic products of the automobile exhaust is carbon monoxide (CO). Exposure for one hour to a concentration of this gas of 120 parts per million causes inactivation of about 5 per cent of the body hemoglobin by forming CO hemoglobin. Concentrations of CO as high as 100 ppm, often occur in garages, in tunnels, and behind automobiles. Such concentrations are tiny in comparison with those (12,000 ppm) found in cigarette smoke.

The smoker survives because most of the time he breathes air not so heavily polluted. Nevertheless the smoker can carry 15 to 20 per cent CO hemoglobin for hours and seriously reduce the oxygen supply to already compromised areas in the brain, heart and elsewhere whose arteries are narrowed by atherosclerotic disease. Furthermore, in a poorly ventilated smoke-filled room concentrations of CO can easily reach several hundred parts per million thus exposing smokers and non-smokers present to a toxic hazard. The headache and fatigue that those exposed experience after a time in such an atmosphere is no accident and not psychosomatic.

The concentration of carbon monoxide that a smoker is exposed to continuously is not 42,000 ppm. This is the concentration of pure cigarette smoke which reaches the lung diluted with atmospheric air. The concentration of carbon monoxide in expired air would be a more reasonable estimation. Ringold et al (1962) have reported the following observations with regard to the latter: heavy smokers had a concentration of 16.4 ppm, light smokers 7.7 ppm and non-smokers 0.8 ppm (see page 19).

1005051233

(34) NAHUM L H: The effects of carbon monoxide on human health. Conn Med
33: 90-2, 1969.

CO. occurs in high concentration in cigarette smoke greater than 2 per cent, this means 20,000 ppm, although an estimate of the average concentration in smoke is much less—400 ppm. In a population of longshoremen smoking produced 6 per cent of COHb. When it comes to occupational exposure 12-14 per cent of employed persons had occupations in which there is a likelihood of exposure. Various forms of indoor combustion may emit CO, and a number of deaths each year are due to poisoning from this source. Gas fired baseboard heaters were incriminated by Michigan State Department of Public Health. Open fires and charcoal braziers produce substantial amounts of CO.

(a) Blood levels of habitual smokers have been reported by 11 groups of investigators. The overall peak after smoking was 5.26% (see page 20). The blood levels 4 to 12 hours after smoking have been reported by 30 groups of investigators with an overall mean of 3.76%. The smoker throughout 24 hours sustains a level between 3.76% and 5.26% (see page 12).

Grut² alleged that 46 per cent of 721 drivers had chronic CO. poisoning characterized by fatigue, headache, irritability, dizziness, disturbed sleep and other symptoms. Some subjects had abnormal neurological symptoms. From the epidemiological point of view it is desirable to obtain data which would show whether there are CO. associated increases in such relatively frequent events as motor vehicle accidents or in fatality rates with myocardial infarction to confirm the data from the Los Angeles Hospitals where an association of CO. and case fatality rates in 3,080 patients with myocardial infarction was observed. The central nervous system effects are definitely due to anoxia. The mechanism of myocardial effects probably are similarly produced. Lindenberg³ did obtain significant electrocardiographic changes on exposing dogs for six weeks to 50 ppm. CO. They also showed dilatation of the right ventricle, scarring of heart muscle and fatty degeneration. A very important question for epidemiologists to study is whether exposure to low concentrations of CO. have a role in the development of human heart disease. Inferring from results of acute toxicologic and experimental studies, we can begin to appreciate the abundant data linking cigarette smoking to coronary heart disease. As far as cigarette smoking is concerned we must keep in mind that high levels of COHb. imply also increased respiratory absorption of other ingredients of tobacco smoke.⁴

1005051234

Commentary (34) Nahum, Cont.

It is safe to say that exposure to CO₂ is widespread, that the smoker who inhales 6 per cent CO₂ is developing a blood concentration which is a serious threat to the health in persons with underlying cardiovascular disease. It is also true that community air pollution may produce COHb in non-smokers similar to that observed in smokers. Even low and commonly occurring CO₂ exposures may impair performance of complex psychomotor tasks. Finally that CO₂ has a role in motor vehicle accidents, is supported by data of high COHb in many drivers involved in accidents.

L.H.N.

References

1. Goldsmith, J. R. and Landow, S. A.: Carbon monoxide and human health. Science, 162: 1352, December 20, 1968.
2. Grut, A.: Chronic carbon monoxide poisoning. (Munksgaard) Copenhagen, 1969, p. 44.
3. Lindenberg, R., Levy, D., Pierosi, T. and Christensen, M.: paper presented at a meeting of the American Industrial Hygiene Association, Washington, D.C., 1962.
4. Nahum, L. H.: Toxic products in cigarette smoke: pleasure or poison. Conn. Med., 32: 154, March, 1968.

(b) Each statement in this paragraph can be challenged by work of other investigators. For instance, at a meeting Lindenberg et al presented the electrocardiographic changes on exposing dogs for 6 weeks to 50 ppm carbon monoxide. De Bias et al (1972) published the results of their investigations indicating that exposure of dogs to 100 ppm carbon monoxide for 14 weeks does not influence the heart that has been previously infarcted (see page 62).

1005051235

- (35) ROSE E F and ROSE M: Carbon monoxide: A challenge to the physician.
Clin Med 78: 12-21, 1971.

The amount of CO in cigarette smoke varies between 1 and 2.5 per cent by volume,⁴ and can create discomfort not only for the addict but also for others in the environment. For the average smoker, the concentration of CO reaching the alveoli is about 0.01 per cent (400 ppm). The importance of cigarette-produced CO is amply demonstrated by samplings from fleet submarines submerged for extended periods. In 30 hours, concentrations may reach 0.01 per cent (100 ppm),⁵ with cigarette smoke accounting for 75 to 80 per cent of the CO production.⁶ This exceeds the allowable maximum concentrations recommended by the American Conference of Governmental Industrial Hygienists, which states that CO concentrations in the atmosphere should be kept below 50 ppm.⁷

(a) The concentration of carbon monoxide reaching the alveoli is not 400 ppm for the average smoker. Jongbloed (1939) noted the highest level of 31.5 ppm after a subject finished smoking a 4th cigarette (see page 19).

Because individuals who smoke from 20 to 30 cigarettes daily have a COHb level ranging from three to 10 per cent,¹⁶ there is a widespread mistaken idea that smokers are more susceptible to environmental CO than are nonsmokers. CO from cigarettes and CO in the ambient air are not additive in their biologic effects. CO is absorbed into the bloodstream only when the pressure of CO in the ambient air exceeds that in the pulmonary capillary blood. Thus, persons with COHb levels of five per cent as a result of smoking do not absorb further CO unless the environmental CO concentrations exceed 0.003 to 0.004 per cent.

1005051236

(b) The cited reference 16 is Barach et al (1941). Although the range is 3% to 10%, the mean value is 5.7% for the carboxyhemoglobin level. Other groups of investigators reported mean values of 4.3 and 4.85% (see page 21).

Commentary (35) Rose, Cont.

c' When cardiac function is normal there is a significant margin of safety even though the CO intoxication is of long duration. A variety of electrocardiographic aberrations have been observed following CO poisoning, but typically there is a low-voltage pattern.³³ Recovery is apparently rapid following the restoration of oxygen and there is a reversion to a "normal" electrocardiogram; however, enzyme studies may show alterations indicating ischemic heart damage.³² Epidemiologic studies of cigarette smokers indicate that the death rate from coronary heart disease is considerably higher for smokers than for nonsmokers,³⁴ and in patients with heart disease there is deterioration of cardiac-function indices at blood levels of seven to nine per cent COHb.³⁵

(c) The cited reference for the last sentence is by Dinman (1970), an editorial that is commented upon elsewhere in this report (see page 160).

1005051237

- (36) SELTZER C C: The effect of cigarette smoking on coronary heart disease. Arch Environ Health 20: 418-23, 1970.

This article reviews the effect of cigarette smoking on coronary heart disease. Seltzer discusses the shortcomings of interpretations appearing in the Surgeon General's report. The question as to the role of carbon monoxide in cigarette smoke is discussed. It should be noted that the work of Ayres quoted in the article has been commented upon elsewhere (see page 148).

6. Does the carbon monoxide constituent of cigarette smoke result in or contribute to increased myocardial infarction or sudden death either in normal individuals or in persons with already impaired coronary circulation due to CHD?

Studies have shown that the carbon monoxide constituent of cigarette smoke does effect increases (2% to 10%) in the levels of carboxyhemoglobin (COHb) saturation when heavy cigarette smokers and nonsmokers were compared, with the consequent displacement of oxyhemoglobin. In addition, carbon monoxide effects a shift to the left of the oxygen-hemoglobin dissociation curve, which may result in a decreased release of oxygen at the tissue level.²¹

On the whole, experimental and clinical investigations bearing on this question are few. The most salient work in this area has been performed by Ayres and associates.²¹ In 20 human subjects before and after carbon monoxide inhalation, these investigators found no significant change in oxygen tension. In another experiment, after exposure to carbon monoxide, coronary blood flow increased significantly in seven non-CHD patients but not in four patients with arteriographically proven CHD. In the patients with CHD, myocardial lactate and pyruvate extraction decreased or shifted to actual production, suggesting anaerobic metabolism.

If carbon monoxide does in fact appreciably decrease oxygen extraction at the myocardial level, the matter of oxygen consumption may hinge on the extent of increase in coronary blood flow in normal persons, while in persons with diseased coronary arteries, the increase in blood flow is slight or absent. Hence, it may be a question of the ultimate balance of these opposing forces. In normal persons, there is the presumption that the increased coronary blood flow more than matches the presumed decrease in oxygen extraction. Whether or not this fails to occur in patients with obvious CHD, to such an extent as to "trigger" a coronary event is as yet unknown and much work remains to be done in this area.

1005051238

X. RECOMMENDATIONS

Three types of investigations are recommended to supplement the available information on the role of carbon monoxide in cigarette smoking.

They are as follows:

1. Carboxyhemoglobin blood levels of habitual smokers and passive smokers. Most of the reported investigations pertain to the blood level before and the peak level after cigarette smoking. It is necessary to take hourly samples in the course of a day and less frequently samples at night, to derive an integrated blood level. In the same investigation, the subjects, both smokers and nonsmokers, will be exposed to varying levels of muscular activity and will include some with chronic pulmonary or coronary heart disease.

2. Comparison of cigarette smoking and carbon monoxide inhalation.

Of all the investigations on the effects of inhalation of carbon monoxide in man and animals almost none extend to a comparison of the equivalent carboxyhemoglobin level with that produced by cigarette smoking. Investigators should be encouraged to include cigarette smoking in their investigation of carbon monoxide inhalation. Special procedures that will determine the development of tolerance to carbon monoxide and the interaction between carbon monoxide and other constituents of cigarette smoke may be added to the investigation. **1005051239**

3. Retrospective studies of workers in an environment containing carbon monoxide. Tunnel workers and miners may be conveniently studied for incidence of coronary heart disease. The limited number of reports on such individuals so far fail to show any disturbance that could be attributed to chronic exposure to carbon monoxide.

Additional Bibliography List, No. 1

ANALYSIS OF CARBOXYHEMOGLOBIN IN THE BLOOD

- AINSWORTH C A, SCHLOEGEL E L, DOMANSKI T J and GOLDBAUM L R : A gas chromatographic procedure for the determination of carboxyhemoglobin in postmortem samples. J Forensic Sci 12: 529-37, 1967. A 1
- ANDERHUB H P, HOFER P and SCHERRER M : Normalwerte der Hb-CO-Sättigung des Blutes. (Normal values of Hb-CO saturation of blood.) Schweiz Med Wochenschr 100: 739-45, 1970. A 2
- ANDERSON S R and ANTONINI E : The binding of carbon monoxide by human hemoglobin. Proof of validity of the spectrophotometric method and direct determination of the equilibrium. J Biol Chem 243: 2918-20, 1968. A 3
- AYRES S M, CRISCITIELLO A and GIANNELLI S Jr : Determination of blood carbon monoxide content by gas chromatography. J Appl Physiol 21: 1368-70, 1966. A 4
- BAUER H J : Beitrag zur Bestimmung von Kohlenoxidhamoglobin. (Contribution to the determination of carbon monoxide hemoglobin). Pharm Zentralhalle Deutsch 104: 25-6, 1965. A 5
- BEECKMANS J M : Determination of the carboxyhaemoglobin saturation of blood by spectrophotometric analysis. Brit J Industr Med 24: 71-2, 1967. A 6
- BJURE J and NILSSON N J : Spectrophotometric determination of oxygen saturation of hemoglobin in the presence of carboxyhemoglobin. Scand J Clin Lab Invest 17: 491-500, 1965. A 7
- BLACKMORE D J : The determination of carbon monoxide in blood and tissue. Analyst 95: 439-58, 1970. A 8
- BREYSSE P A, BOVEE H H and GABAY L F : Comparison of field methods for estimating carbon monoxide hemoglobin percentages. Amer Industr Hyg Ass J 27: 256-9, 1966. A 9
- BUCHWALD H : A rapid and sensitive method for estimating carbon monoxide in blood and its application in problem areas. Amer Industr Hyg Ass J 30: 564-9, 1969. A 10
- CIUHANDU G, RUSU V, DIACONOVICI M and KISS L : Indirekte Bestimmung des Kohlenmonoxyds im Blut. (Indirect determination of carbon monoxide in blood). Z Klin Chem 4: 247-9, 1966. A 11
- COLLISON H A, RODKEY F L and O'NEAL J D : Determination of carbon monoxide in blood by gas chromatography. Clin Chem 14: 162-71, 1968. A 12
- COMMINS B T and LAWTHORP P J : A sensitive method for the determination of carboxyhaemoglobin in a finger prick sample of blood. Brit J Industr Med 22: 139-43, 1965. A 13
- DATSENKO I I : (Determination of the carboxyhemoglobin in the blood with photoelectric colorimeters). Lab Delo 2: 108-10, 1965. A 14
- DOMINGUEZ A M, HALSTEAD J R and DOMANSKI T J : The effect of postmortem changes on carboxyhemoglobin results. J Forensic Sci 9: 330-41, 1964. A 15
- DORSCH J and KOSTER E : Eine Methode zur schnellen Bestimmung von Kohlenmonoxyd im Blut mittels Atlas-Oxymeter. (A rapid test for the determination of carbon monoxide in the blood by means of the Atlas oxymeter). Med Welt 19: 1068-70, 1965. A 16
- EFFENBERGER E : Untersuchungen über den CO-Hb-Gehalt des Blutes in Abhängigkeit von der CO-Konzentration der Luft bei ruhenden Versuchspersonen. (Studies on the COHb content of blood in relation to the CO concentration of the air in subjects at rest). Arch Hyg Bakt 151: 455-74, 1967. A 17

1005051240

- ENGEL R R, RODKEY F L and KRILL C E : Carboxyhemoglobin levels as an index of hemolysis. Pediatrics 47: 723-30, 1971. A 18
- ERBEN J : Zur Bestimmung des Carboxyhamoglobins im Leichenblut. (On the determination of carbonyl hemoglobin in cadaver blood). Deutsch Z Ges Gerichtl Med 60: 6-13, 1967. A 19
- FALCONER B and MOLLER M : The determination of carbon monoxide in blood treated with formaldehyde. Z Rechtsmed 68: 17-9, 1971. A 20
- FELDSTEIN M : The determination of blood carbon monoxide by infrared spectrophotometry. J Forensic Sci 10: 43-51, 1965. A 21
- FENN W O : Partial molar volumes of oxygen and carbon monoxide in blood. Resp Physiol 13: 129-40, 1971. A 22
- FRANCHINI A, CANALE M and CELESTI R : La spectrophotometrie pour le dosage de la carboxy-hemoglobine. (Spectrophotometry for determination of carboxy-hemoglobin). Ann Med Leg (Paris) 47: 274-7, 1967. A 23
- FREIREICH A W and LANDAU D : Carbon monoxide determination in postmortem clotted blood. J Forensic Sci 16: 112-9, 1971. A 24
- GASSMAN H B and WRANNE L : Microdetermination of carbon monoxide in blood. Acta Soc Med Upsal 72: 277-82, 1967. A 25
- GYDELL K : Simplified method for determining carbon monoxide hemoglobin saturation in diagnosis of hemolytic disorders. Acta Med Scand 179: Suppl 445: 284-7, 1966. A 26
- HANSSON R and SUNDSTROM G : Kolmonoxidbestämning i blod. (Carbon monoxide determination in the blood). Nord Med 82: 981-4, 1969. A 27
- HELLUNG-LARSEN P, KJELSEN K, MELLEMGAAARD K and ASTRUP P : Photometric determination of oxyhemoglobin saturation in the presence of carbon monoxide hemoglobin, especially at low oxygen tensions. Scand J Clin Lab Invest 18: 443-9, 1966. A 28
- JAVANOVIC D A and POLOVINA J : Prilog pitanju paladometrijskog odredivanja ugljen-monoksida u krvi u laboratoriju i na terenu. (Contribution to the problem of palladometric determination of carbon monoxide in the blood under laboratory and field conditions). Vojnosanit Pregl 21: 165-8, 1964. A 29
- KLINGENMAIER H C, BEHAR M G and SMITH T C : Blood oxygen content measured by oxygen tension after release by carbon monoxide. J Appl Physiol 26: 653-5, 1969. A 30
- KOCH L : Über eine modifizierte spektralphotometrische Methode zur COHb-Bestimmung und ihre Anwendbarkeit in der Arbeitsmedizin. (On a modified spectrophotometric method for COHb determination and its usefulness in industrial medicine.) Z Ges Hyg 11: 267-75, 1965. A 31
- KOSTLER D, OTTO H, RITTIG J and POLSTER U : Beitrag zur spektralfotometrischen Kohlenmonoxid-Hamoglobin-Bestimmung. (Contribution to the spectrophotometric determination of carbon monoxide and hemoglobin). Deutsch Gesundh 22: 1740-3, 1967. A 32
- KRUSMANN K, SCHRODER H and SCHRODER J : Die Bestimmung von Kohlenoxid im Blut mit Hilfe des nicht-dispersiven Infrarot-Absorptions-Differenzverfahrens. (The determination of carbon monoxide in blood by means of a non-dispersive infrared differential absorption technique). Arch Toxikol 27: 99-105, 1971. A 33
- BRETON R L, GARAT J and DEROBERT L : Quelle precision peut-on accorder a la determination du coefficient d'intoxication oxycarbonee par la methode spectrometrique en fonction de la desintegration du complexe hemoglobinique apres la mort? (What exactness can be conceded in determining the coefficient of carbon monoxide poisoning by the spectrometric method as a function of disintegration of the hemoglobin complex after death?) Med Leg Donn Corp Paris 2: 142-3, 1969. A 34

1005051241

- LEHMANN J : On the conservation and determination of 5-hydroxytryptamine in blood. Scand J Clin Lab Invest 21: 368-74, 1968. A 35
- LINDERHOLM H : A micromethod for the determination of carbon monoxide in blood. Acta Physiol Scand 64: 372-6, 1965. A 36
- LINDERHOLM H, SJOSTRAND T and SODERSTROM B : A method for determination of low carbon monoxide concentration in blood. Acta Physiol Scand 66: 1-8, 1966. A 37
- MARKIEWICZ J : Badania in vitro nad COHb pochodzenia endogennego w sekcyjnie pobranych probkach krwi. (Studies in vitro on oxidocarbonic hemoglobin of endogenic origin in blood samples taken at autopsy). J Przegl Lek 22: 615-6, 1966. A 38
- McCREDIE R M and JOSE A D : Analysis of blood carbon monoxide and oxygen by gas chromatography. J Appl Physiol 22: 863-4, 1967. A 39
- NOBEL S and RICKER A : Dumbbell-diffusion screening for carbon monoxide, volatile alcohols, and chlorinated hydrocarbons in blood. Clin Chem 13: 276-80, 1967. A 40
- PALMA-CARLOS A G, PALMA-CARLOS M L and SOARES A D : L'etude de la concentration du CO sanguin en quelques hemopathies. (The study of serum CO concentration in some hemopathies). Sangre (Barc) 9: 289-92, 1964. A 41
- RODKEY F L and COLLISON H A : An artifact in the analysis of oxygenated blood for its low carbon monoxide content. Clin Chem 16: 896-9, 1970. A 42
- RODKEY L F, COLLISON H A and O'NEAL J D : Influence of oxygen and carbon monoxide concentration on blood carboxyhemoglobin saturation. Aerosp Med 42: 1274-8, 1971. A 43
- SMALL K A, RADFORD E P, FRAZIER J M, RODKEY F L and COLLISON H A : A rapid method for simultaneous measurement of carboxy- and methemoglobin in blood. J Appl Physiol 31: 154-60, 1971. A 44
- SUNDSTROM G : Enkel COHb-metodik vid hemolytiska tillstand. (Simple COHb method in the hemolytic state) Nord Med 84: 1499, 1970. A 45
- SUNDSTROM G : Blood carboxyhemoglobin: Results with conventional standards compared with those with a submicroliter reference of gaseous CO. Clin Chem 18: 188-92, 1972. A 46
- TAKANO M, GOTO Y, TAKEYA K and SAKAHIGASHI M : (Problems and re-evaluation of quantitative determination of carbon monoxide in the blood). Jap J Clin Pathol 19: Suppl: 505, 1971. A 47
- TAYLOR J D and MILLER J D M : A source of error in the cyanmethemoglobin method of determination of hemoglobin concentration in blood containing carbon monoxide. Amer J Clin Path 43: 265-71, 1965. A 48
- WALD N J and FENTON J : Artefact due to traces of detergent on laboratory glassware affecting carboxyhaemoglobin measurement. Clin Chim Acta 39: 266-8, 1972. A 49
- WEATHERBURN M W and LOGAN J E : Hemoglobinometry. Clin Chem 15: 261-3, 1969. A 50
- WEDERKINCH W F : Semi-micro method for the determination of carboxy-hemoglobin by microdiffusion, reduction of palladium ions and titration of iodide. Scand J Clin Lab Invest 16: 365-71, 1964. A 51
- WIECZOREK H : Bestimmung kleiner Kohlenmonoxidgehalte in biologischem Material. (Determination of small amounts of carbon monoxide in biological material). Mikrochim Acta 4: 802-5, 1968. A 52

1005051242

WOJAHN H: Die CO-Hb-Konzentration in Blutunterlaufungen bei todtlichen Kohlenmonoxydvergiftungen. (The CO-Hb concentration in blood suffusions in fatal carbon monoxide poisoning). Deutsch Z Ges Gerichtl Med 59: 99-101, 1967.

A 53

ZORN H: Nachweis von Kohlenmonoxid zur Diagnostik der CO-Vergiftung. (Demonstration of carbon monoxide in the diagnosis of CO poisoning). Dtsch Med Wochensh 94: 1692-5, 1969.

A 54

1005051243

REACTION OF CARBON MONOXIDE WITH HEMOGLOBIN

- AINSWORTH S and BINGHAM W S W : Reactions of partially oxidised hemoglobin solutions. II. A matrix rank analysis of the initial rates of binding carbon monoxide. Biochim Biophys Acta 160: 10-7, 1968. Reprint
A 55
- ALBEN J O and CAUGHEY W S : An infrared study of bound carbon monoxide in the human red blood cell, isolated hemoglobin, and heme carbonyls. Biochem 7: 175-83, 1968. A 56
- ALFSEN A, CHIANCONE E, ANTONINI E, WAKS M and WYMAN J : Studies on the reaction of haptoglobin with hemoglobin and hemoglobin chains. III. Observations on the kinetics of the reaction of the haptoglobin-hemoglobin complexes with carbon monoxide. Biochim Biophys Acta 207: 395-403, 1970. A 57
- ALPERT B and BANERJEE R : Photodissociation of carbon monoxide from some new hemoglobin derivatives. A possible case of energy transfer. Biochem Biophys Res Commun 42: 608-14, 1971. A 58
- ANDERSEN M E and GIBSON Q H : A kinetic analysis of the binding of oxygen and carbon monoxide to Lamprey hemoglobin. J Biol Chem 246: 4790-99, 1971. A 59
- ANDERSON N M, REED T A and CHANCE B : A lower limit for the rate of a conformation change in hemoglobin. Ann NY Acad Sci 174: 189-92, 1970. A 60
- ANTONINI E, SCHUSTER T M, BRUNORI M and WYMAN J : The kinetics of the Bohr effect in the reaction of human hemoglobin with carbon monoxide. J Biol Chem 240: 2262-4, 1965. A 61
- ANTONINI E, BUCCI E, FRONTICELLI C, WYMAN J and ROSSI-FANELLI A : The properties and interactions of the isolated α and β chains of human haemoglobin. III. Observations on the equilibria and kinetics of the reactions with gases. J Mol Biol 12: 375-84, 1965. A 62
- ANTONINI E, BRUNORI M, WYMAN J and NOBLE R W : Preparation and kinetic properties of intermediates in the reaction of hemoglobin with Ligands. J Biol Chem 241: 3236-8, 1966. A 63
- ANTONINI E, CHIANCONE E and BRUNORI M : Studies on the relations between molecular and functional properties of hemoglobin. VI. Observations on the kinetics of hemoglobin reactions in concentrated salt solutions. J Biol Chem 242: 4360-6, 1967. A 64
- ANTONINI E, ANDERSON N M and BRUNORI M : Properties of the product of partial photodissociation of carbon monoxide hemoglobin. J Biol Chem 247: 319-21, 1972. A 65
- APPLEBY C A : Electron transport systems of rhizobium japonicum. I Haemoprotein P-450, other co-reactive pigments, cytochromes and oxidases in bacteroids from N_2 -fixing root nodules. Biochim Biophys Acta 172: 71-87, 1969. A 66
- ASTRUP P : Intracellular 2, 3-diphosphoglycerate and carbon monoxide exposure. Ann NY Acad Sci 174: 252-4, 1970. A 67
- BANERJEE R, DOUZOU P and LOMBARD A : Kinetics of association of carbon monoxide with haemoglobin at low temperature. Nature 217: 23-5, 1968. A 68
- BENESCH R, GIBSON H Q and BENESCH R E : Preliminary communications. Rates of reaction of hemoglobin H with Ligands. J Biol Chem 239: 1668-9, 1964. A 69
- BENESCH R E, MAEDA N and BENESCH R : 2, 3-Diphosphoglycerate and the relative affinity of adult and fetal hemoglobin for oxygen and carbon monoxide. Biochim Biophys Acta 257: 178-182, 1972. A 70
- BETKE K and SHEPARD M K : Verteilung von Kohlenmonoxid auf die Erythrozytenpopulation bei Partialsättigung. Folia Haematologica 89: 135-8, 1968. A 71

1005051244

- BETKE K: Cytological differentiation of haemoglobin. Bibl Haemat 29: 1085-93, 1968. A 72
- BIDE R W and COLLIER H B: A note on the methemoglobin^{reductase} activity of rabbit erythrocytes. Canad J Biochem 42: 669-73, 1964. A 73
- BRUNORI M: The carbon monoxide Bohr effect in hemoglobin from *Thunnus thynnus*. Arch Biochem 114: 195-199, 1966. A 74
- BRUNORI M, ANTONINI E, WYMAN J, TENTORI L, VIVALDI G and CARTA S: The hemoglobin of amphibia. VII. Equilibria and kinetics of the reaction of frog hemoglobin with oxygen and carbon monoxide. Comp Biochem Physiol 24: 519-26, 1968. A 75
- BRUNORI M, BONAVENTURA J, BONAVENTURA C, ANTONINI E and WYMAN J: Carbon monoxide binding by hemoglobin and myoglobin under photodissociating conditions. Proc Nat Acad Sci 69: 868-71, 1972. A 76
- CAUGHEY W S, ALBEN J O, McCOY S, BOYER S H, CHARACHE S and HATHAWAY P: Differences in the infrared stretching frequency of carbon monoxide bound to abnormal hemoglobins. Biochem 8: 59-62, 1969. A 77
- CAUGHEY W S: Part III. Biochemical and physiological effects of carbon monoxide. Carbon monoxide bonding in hemoproteins. Ann NY Acad Sci 174: 148-53, 1970. A 78
- CHEAH K S: The membrane-bound carbon monoxide-reactive hemoproteins in the extreme halophiles. Biochim Biophys Acta 197: 84-6, 1970. A 79
- CHRISTIANSEN E and MAGID E: Effects of phosphate, HEPES, N_2O and CO on the kinetics of human erythrocyte carbonic anhydrases B and C. Biochim Biophys Acta 220: 630-2, 1970. A 80
- CROSETTI L, RUBINO G F and PETTINATI L: Osservazioni in tema di detossicazione dell'emoglobina nell'uomo esposto a rischio prolungato da ossido di carbonio. (Observations on detoxication of hemoglobin in men exposed to prolonged risk of carbon monoxide). Minerva Med 57: 268-9, 1966. A 81
- DINMAN B D, EATON J W and BREWER G J: Effects of carbon monoxide on DPG concentrations in the erythrocyte. Ann NY Acad Sci 174: 246-51, 1970. A 82
- ENGEL R R, RODKEY F L, O'NEAL J D and COLLISON H A: Relative affinity of human fetal hemoglobin for carbon monoxide and oxygen. Blood 33: 37-45, 1969. A 83
- FORMAN H J and FEIGELSON P: Kinetic evidence indicating the absence during catalysis of an unbound ferroporphyrin form of tryptophan oxygenase. Biochem 10: 760-3, 1971. A 84
- FUKUI K and KAKIUCHI Y: The kinetics of the reaction of $CO + O_2Hb = O_2COHb$ in human-hemoglobin in solution at a low pCO range. Jap J Physiol 20: 332-347, 1970. A 85
- GEDDES R and STEINHARDT J: Factors affecting the release by dilute acid of hidden prototropic groups in carbonylhemoglobin. J Biol Chem 243: 6056-63, 1968. A 86
- GEORGE P and SCHEJTER A: The reactivity of ferrocytochrome c with iron-binding Ligands. J Biol Chem 239: 1504-8, 1964. A 87
- GIBSON Q H, PALMER G and WHARTON D C: The binding of carbon monoxide by cytochrome c oxidase and the ratio of the cytochromes a and a_3 . J Biol Chem 240: 915-20, 1965. A 88
- GIBSON Q H, HELLER P and YAKULIS V: The rate of reaction of carbon monoxide with hemoglobins M. J Biol Chem 241: 1650-1, 1966. A 89
- GIBSON Q H and KAMEN M D: Kinetic analysis of the reaction of cytochrome cc' with carbon monoxide. J Biol Chem 241: 1969-76, 1966. A 90

1005051245

- GIBSON Q H and PARKHURST L J : Kinetic evidence for a tetrameric functional unit in hemoglobin. J Biol Chem 243: 5521-4, 1968. A 91
- GLASS H I, EDWARDS R H T, De GARRETA A C and CLARK J C : ^{14}C red cell labeling for blood volume and total hemoglobin in athletes: effect of training. J Appl Physiol 26: 131-3, 1969. A 92
- GRAY R D and GIBSON Q H : Kinetic investigation of haemoglobin Bohr effect by flash photolysis. Nature London 226: 77-8, 1970. A 93
- GRAY R D and GIBSON Q H : The binding of carbon monoxide to α and β chains in tetrameric mammalian hemoglobin. J Biol Chem 246: 5176-8, 1971. A 94
- GRAY R D and GIBSON Q H : The effect of inositol hexaphosphate on the kinetics of CO and O_2 binding by human hemoglobin. J Biol Chem 246: 7168-74, 1971. A 95
- GRIFFIN J B and HOLLOCHER T C : Evidence for the binding of oxygen and carbon monoxide by succinic dehydrogenase. Biochem Biophys Res Commun 26: 405-10, 1967. A 96
- GUIDOTTI G and KONIGSBERG W : The characterization of modified human hemoglobin. I. Reaction with iodoacetamide and N-ethylmaleimide. J Biol Chem 239: 1474-84, 1964. A 97
- HANISCH G, ENGEL J, BRUNORI M and FASOLD H : Ligand induced conformational changes in various normal and modified hemoglobins as indicated by changes in optical rotatory dispersion. Europ J Biochem 9: 335-42, 1969. A 98
- HAYASHI N, MOTOKAWA Y and KIKUCHI G : Studies on relationships between structure and function of hemoglobin M_{Iwate} . J Biol Chem 241: 79-84, 1966. A 99
- HILDEBRANDT A G, FRANKLIN M R, ROOTS E and ESTABROOK R W : The inhibitory effect of metyrapone on cytochrome P-450-catalyzed mixed-function oxidation reactions as compared to the effect of carbon monoxide. Chem Biol Interact 3: 276-8, 1971. A 100
- HOLLAND R A B : Cell and solution velocity constants for the reaction $\text{CO} + \text{Hb} = \text{COHb}$ at different temperatures in mammals with different red cell sizes. J Gen Physiol 49: 199-220, 1965. A 101
- HOLLAND R A B : Kinetics of combination of O_2 and CO with human hemoglobin F in cells and in solution. Res Physiol 3: 307-17, 1967. A 102
- HOLLAND R A B : Rate of O_2 dissociation from O_2Hb and relative combination rate of CO and O_2 in mammals at 37°C . Res Physiol 7: 30-42, 1969. A 103
- HOLLAND R A B : Rate at which CO replaces O_2 from O_2Hb in red cells of different species. Resp Physiol 7: 43-63, 1969. A 104
- HOLLAND R A B : Reaction rates of carbon monoxide and hemoglobin. Ann NY Acad Sci 174: 154-71, 1970. A 105
- HORIE S : On the absorption spectrum of cytochrome a_3 . J Biochem 56: 57-71, 1964. A 106
- HORIE S : An alternative method for the calculation of reduced and oxidized absorption spectra of the respiratory enzyme. J Biochem 57: 650-6, 1965. A 107
- HUBER R, EPP O and FORMANEK H : Structures of deoxy- and carbonmonoxy-erythrocyrin. J Mol Biol 52: 349-54, 1970. A 108
- JEFCOATE C R E and GAYLOR J L : A model for the interaction of cytochrome P-450 with carbon monoxide. J Am Chem Soc 91: 4610-1, 1969. A 109

1005051246

- KEYES M, MIZUKAMI H and LUMRY R: Equilibrium measurement in the reactions of Heme-proteins with gaseous Ligands. Anal Biochem 18: 126-42, 1967. A 110
- KOSMIDER S, ZURKOWSKI Z and WEGIEL A: Wplyw Hg, KCN i CO in vitro na zasadowa fosfataze granulocytow. (In vitro effects of Hg, KCN and CO on granulocyte alkaline phosphatase). Pol Arch Med Wewn 35: 477-81, 1965. A 111
- LANDAW S A, CALLAHAN E W and SCHMID R: Catabolism of heme in vivo: comparison in the simultaneous production of bilirubin and carbon monoxide. J Clin Invest 49: 914-25, 1970. A 112
- LAWSON W H Jr: Effect of anemia, species, and temperature on CO kinetics with red blood cells. J Appl Physiol 31: 447-57, 1971. A 113
- LEVIN W, ALVARES A P and KUNTZMAN R: Distribution of radioactive hemoprotein and CO-binding pigment in rough and smooth endoplasmic reticulum of rat liver. Arch Biochem Biophys 139: 230-5, 1970. A 114
- MacQUARRIE R and GIBSON Q H: Use of a fluorescent analogue of 2, 3-Diphosphoglycerate as a probe of human hemoglobin conformation during carbon monoxide binding. J Biol Chem 246: 5832-5, 1971. A 115
- MANSLEY G E, STANBURY J T and LEMBERG R: Cytochrome oxidase and its derivatives. VI. The CO combining capacity of cytochrome c oxidase. Biochem Biophys Acta 113: 33-40, 1966. A 116
- Mc CONNELL H M, DEAL W and OGATA R T: Spin-labeled hemoglobin derivatives in solution, polycrystalline suspensions, and single crystals. Biochem 8: 2580-5, 1969. A 117
- MEDA E: Cinetica della reazione dell'emoglobina umana con l'ossido di carbonio. Rass Med Industr 33: 292-5, 1964. A 118
- MEL'NICHENKO R K: (Combined effect of carbon monoxide and hydrogen sulfide). Vrach Delo 7: 87-90, 1968. A 119
- MOON R B and RICHARDS J H: Nuclear magnetic resonance studies of CO binding to various heme globins. J Am Chem Soc 94: 5093-5, 1972. A 120
- MORRISON M and HORIE S: Cytochrome c oxidase components. VII. An evaluation of the carbon monoxide-combining capacity in order to determine the stoichiometry of cytochromes a and a₃. J Biol Chem 240: 1359-64, 1965. A 121
- and WYMAN J
- MURRAY J D: Facilitated diffusion. The case of carbon monoxide. J Biol Chem 246: 5903-6, 1971. A 122
- NAGANO T: Der einfluss von Hitze auf die Affinitat Zwischen Hamoglobin und Kohlenmonoxyd. (Influence of heat on the affinity between hemoglobin and carbon monoxide). Wakayama Med Rep 11: 161-8, 1967. A 123
- NAGEL R L and GIBSON Q H: Kinetics of the reaction of carbon monoxide with the hemoglobin-haptoglobin complex. J Mol Biol 22: 249-55, 1966. A 124
- NAGEL R L, GIBSON Q H and JENKINS T: Ligand binding in hemoglobin J Capetown. J Mol Biol 58: 643-50, 1971. A 125
- NAGEL R L, GIBSON Q H and HAMILTON H B: Ligand kinetics in hemoglobin Hiroshima. J Clin Invest 50: 1772-5, 1971. A 126
- NOBLE R W, BRUNORI M, WYMAN J and ANTONINI E: Studies on the quantum yields of the photodissociation of carbon monoxide from hemoglobin and myoglobin. Biochem 6: 1216-22, 1967. A 127

1005051247

- NOBLE R W, PARKHURST L J and GIBSON Q H: The effect of pH on the reactions of oxygen and carbon monoxide with the hemoglobin of the carp, *cyprinus carpio*. J Biol Chem 245: 6628-33, 1970. A 128
- OMURA T, SATO R, COOPER D Y, ROSETHAL O and ESTABROOK R W: Function of cytochrome P-450 of microsomes. Fed Proc 24: 1181-9, 1965. A 129
- OSKI F A, GOTTLIEB A J, MILLER W W and DELIVORIA-PAPADOPOULOS M: The effects of deoxygenation of adult and fetal hemoglobin on the synthesis of red cell 2, 3-diphosphoglycerate and its in vivo consequences. J Clin Invest 49: 400-7, 1970. A 130
- PARKHURST L J and GIBSON Q H: The reaction of carbon monoxide with horse hemoglobin in solution, in erythrocytes, and in crystals. J Biol Chem 242: 5762-70, 1967. A 131
- PARKHURST L J, GERACI G and GIBSON Q H: Kinetics of the reaction of hybrid-heme hemoglobins with carbon monoxide. J Biol Chem 245: 4131-5, 1970. A 132
- PASECHNIK V I, SHTAMM E V, VLADISLAVLEV E I and ZAMAYATNIN A A: (Change in the volume of hemoglobin a solution induced by CO ligation). Biofizika 16: 939-41, 1971. A 133
- PAULET G and CHEVRIER R: Influence des ions cobalt sur la combinaison de l'hémoglobine avec l'oxyde de carbone. (Influence of cobalt ions on the combination of hemoglobin with carbon monoxide). C R Soc Biol Paris 160: 1726-7, 1966. A 134
- PETTER C, BOURBON J, MALTIER J P and JOST A: Pathologie du développement. - Production d'hémorragies des extrémités chez le fœtus de Rat soumis à une hypoxie in utero. (Production of hemorrhages of the extremities in the rat fetus subjected to hypoxia in utero). C R Acad Sci Paris 272: 2488-90, 1971. A 135
- PHELPS C and ANTONINI E: The combination of carbon monoxide-haem with apoperoxidase. Biochem J 114: 719-24, 1969. A 136
- PIRNAY F, FASSOTTE F, DEROANNE R and PETIT J M: Capacité de transfert du CO en fonction de la consommation d'O₂ chez l'adulte normal. (The capacity for CO transfer as a function of O₂ consumption by normal adults.) Arch Int Physiol 76: 151-2, 1968. A 137
- POLITZER P: A charge-transfer interpretation of the interactions of hemoglobin with oxygen and carbon monoxide. Biochim Biophys Acta 153: 799-803, 1968. A 138
- RAUSA G, DIANA L and PERIN G: Azione in vitro dell'ossido di carbonio e del piombo sull'attività dell'enzima acido delta - amino - levulinico deidratasi di eritrociti umani. (Action in vitro of carbon monoxide and lead on the delta-aminolevulinic acid dehydratase activity of human erythrocytes). Riv Ital Ig 28: 319-27, 1968. A 139
- REED T: Alterations in the heme-carbon monoxide bond strength. Ann NY Acad Sci 174: 172-6, 1970. A 140
- ROUGHTON F J W: The equilibrium of carbon monoxide with human hemoglobin in whole blood. Ann NY Acad Sci 174: 177-88, 1970. A 141
- RUMEN N M and CHANCE B: Heme-Heme interaction of crystalline lamprey hemoglobin. Kinetics and equilibrium of the reaction of carbon monoxide. Biochim Biophys Acta 207: 404-12, 1970. A 142
- SCHMELZER U, STEINER R, MAYER A, NEDETZKA T and FASOLD H: On the kinetics of the reaction of hemoglobin with CO. Flash - Photolysis experiments. Europ J Biochem 25: 491-7, 1972. A 143
- SIRS J A: Uptake of O₂ and CO by partially saturated haemoglobin in sheep erythrocytes. Biochim Biophys Acta 90: 90-9, 1964. A 144
- TZAGOLOFF A and WHARTON D C: Studies on the electron transfer system. LXII. The reaction of cytochrome oxidase with carbon monoxide. J Biol Chem 240: 2628-33, 1965. A 145

1005051248

- WHARTON D C : Valence state of copper after interaction of the cytochrome oxidase-carbon monoxide complex with ferricyanide. Biochim Biophys Acta 92: 607-9, 1964. A 146
- WINTERHALTER K H, AMICONI G and ANTONINI E : Functional properties of a hemoglobin carrying Heme only on α chains. Biochem 7: 2228-32, 1968. A 147
- WITTENBERG B A, ANTONINI E, BRUNORI M, NOBLE R, WITTENBERG J B and WYMAN J : Studies on the equilibria and kinetics of the reaction of peroxidases with Ligands. III. The dissociation of carbon monoxide from carbon monoxide ferro-horseradish peroxidase. Biochem 6: 1970-4, 1967. A 148
- WRANNE L : Studies on erythro-kinetics in infancy. XIV. The relation between anaemia and haemoglobin catabolism in Rh-haemolytic disease of the newborn. Acta Paediat Scand 58: 49-53, 1969. A 149
- YAMAZAKI H, OHISHI S and YAMAZAKI I : CO as a Ligand of photosensitive P-630 transformed from horseradish peroxidase in the presence of indole-3 acetic acid. Arch Biochem Biophys 136: 41-6, 1970. A 150

1005051249

Additional Bibliography List No. 3

ELIMINATION AND METABOLISM OF CARBON MONOXIDE

- | | Reprint |
|--|---------|
| ARIN L M and WARNECK P : Reaction of ozone with carbon monoxide. <u>J Phys Chem</u> 76: 1514-6, 1972. | A 151 |
| COBURN R F, FORSTER R E and KANE P B : Considerations of the physiological variables that determine the blood carboxyhemoglobin concentration in man. <u>J Clin Invest</u> 44: 1899- 910, 1965. | A 152 |
| COBURN R F, SWERDLOW M, LUGMANMAKI K J, FORSTER R E and POWELL K : Uptake of carbon monoxide from the urinary bladder of the dog. <u>Am J Physiol</u> 215: 1010-23, 1968. | A 153 |
| COBURN R F : The carbon monoxide body stores. <u>Ann NY Acad Sci</u> 174: 11-22, 1970. | A 154 |
| FENN W O : The burning of CO in tissues. <u>Ann NY Acad Sci</u> 174: 64-71, 1970. | A 155 |
| FORSTER R E : Carbon monoxide and the partial pressure of oxygen in tissue. <u>Ann NY Acad Sci</u> 174: 233-41, 1970. | A 156 |
| LUOMANMAKI K : Studies on the metabolism of carbon monoxide. <u>Ann Med Exp Fenn</u> 44 Suppl 2: 1-55, 1966. | A 157 |
| LUOMANMAKI K and COBURN R : Effects of metabolism and distribution of carbon monoxide on blood and body stores. <u>Am J Physiol</u> 217: 354-63, 1969. | A 158 |
| MULHAUSEN R O, ASTRUP P and MELLEMGAAARD K : Oxygen affinity and acid-base status of human blood during exposure to hypoxia and carbon monoxide. <u>Scand J Clin Lab Invest</u> 22 Suppl 103: 9-15, 1968. | A 159 |
| PATTONO R, MARCHIARO G, CAPELLARO F and ORIONE G : Dinamica della eliminazione del CO in varie condizioni di rianimazione. (Dynamics of elimination of CO in various conditions of resuscitation). <u>Rass Med Industr</u> 33: 456-7, 1964. | A 160 |
| PETERSON J E and STEWART R D : Absorption and elimination of carbon monoxide by inactive young men. <u>Arch Environ Health</u> 21: 165-71, 1970. | A 161 |
| POWER G G : Solubility of O ₂ and CO in blood and pulmonary and placental tissue. <u>J Appl Physiol</u> 24: 468-74, 1968. | A 162 |
| TRUHAUT R, BOUDÈNE C and CLAUDE J R : Recherches sur les effets de l'exposition prolongée du lapin et du rat à de très faibles concentrations d'oxyde de carbone. I. Etude du rythme de fixation et d'élimination du toxique. Discussion de la notion de remanence de l'oxyde de carbone dans le sang (1). (Effects of prolonged exposure of rabbits and rats to very weak carbon monoxide concentrations. I. Study of the rhythm of fixation and elimination of the poison. Discussion of the concept of residual carbon monoxide in the blood). <u>Arch Mal Prof Paris</u> 28: 341-56, 1967. | A 163 |
| WRANNE L : Studies on erythro-kinetics in infancy. VI. A method for the quantitative estimation of pulmonary excretion of carbon monoxide in infancy. <u>Acta Paediat Scand</u> 56: 374-80, 1967. | A 164 |

1005051250

CARBON MONOXIDE IN POORLY VENTILATED AREAS

- BLACKMORE D J : Interpretation of carboxyhaemoglobin found at post mortem in victims of aircraft accidents. Aerospace Med 41: 757-9, 1970. Reprint A 165
- BLOOM J D : Some considerations in establishing divers' breathing gas purity standards for carbon monoxide. Aerospace Med 43: 633-6, 1972. A 166
- CONKLE J P, MABSON W E, ADAMS J D, ZEFT H J and WELCH B E : Detailed study of contaminant production in a space cabin simulator at 760 Mm of mercury. Aerospace Med 38: 491-9, 1967. A 167
- DILLE J R and MOHLER S R : Drug and toxic hazards in general aviation. Aerospace Med 40: 191-5, 1969. A 168
- EBERSOLE J H : Submarine medicine on Nautilus and Seawolf. Arch Industr Health(Chicago) 18: 200-7, 1958. A 169
- ELLIS W R and SEATONBERRY B W : A radioisotope method for locating points of entry of carbon monoxide into the cabin of an aircraft. Int J Appl Radiat 17: 81-4, 1966. A 170
- HODY G L and BAILEY R W : Weapons exhaust contaminants inside helicopters. Aerospace Med 39: 641-4, 1968. A 171
- JOHNSTON D G and BURGER W D : Injury and disease of scuba and skin divers. Postgrad Med 49: 134-9, 1971. A 172
- JUDD H J : Levels of carbon monoxide recorded on aircraft flight decks. Aerospace Med 42: 344-8, 1971. A 173
- KENT A D : Hazards from products of combustion and oxygen depletion in occupied spaces. Occup Health Rev 21: 1-18, 1970. A 174
- KERTESZ D, ANTONINI E, BRUNORI M, WYMAN J and ZITO R : Studies on the equilibria and kinetics of the reactions of peroxidases with Ligands. I. The reaction of ferropoxidases with carbon monoxide. Biochemistry 4: 2672-6, 1965. A 175
- LIGHTFOOT N F : Chronic carbon monoxide exposure. Proc Roy Soc Med 65: 798-9, 1972. A 176
- LOMONACO T : Breve compendio di medicina aeronautica e spaziale. Continuazione. (Brief compendium of aeronautic and space medicine. Continuation. Minerva Med 62: 3399-34-2, 1971. A 177
- MAGDALENO F M : Tabaco, alcohol y cafe en aviacion. (Tobacco, alcohol and coffee in aviation). Rev Aero Astro 28: 581-5, 1968. A 178
- McFARLAND R A : Human factors in relation to the development of pressurized cabins. Aerospace Med 42: 1303-18, 1971. A 179
- MERLI S, MARCHIORI A, DURANTE F, and MARRACINO F : Ulteriore contributo in tema di identificazione di vittime di disastro aereo. (Further contribution on the identification of air disaster victims). Zacchia 5: 411-37, 1969. A 180
- OKALYI Z : Occupational mortality and morbidity among divers in the Torres Straits. Med J Aust 1: 1239-42, 1969. A 181
- RODKEY F L, COLLISON H A and O'NEAL J D : Influence of oxygen and carbon monoxide concentrations on blood carboxyhemoglobin saturation. Aerospace Med 42: 1274-8, 1971. A 182
- SCHAEFER K E : Environmental physiology of submarines and spacecrafts. Arch Environ Health Chicago 9: 320-31, 1964. A 183

1005051251

SIEGEL P V and MOHLER S R : Medical factors in U. S. general aviation accidents.
Aerospace Med 40: 180-4, 1969.

A 184

STEVENSON P J: The search for the cause of an accident. Proc Roy Soc Med 61: 1076-9, 1968. A 185

VOROSMARTI J Jr, BRADLEY M E, LINAWEAVER P G, KLECKNER J C and ARMSTRONG F W :
Helium-oxygen saturation diving: I. Hematologic, lactic acid dehydrogenase and carbon
monoxide-carboxyhemoglobin studies. Aerospace Med 41: 1347-53, 1970. A 186

1005051252

ATMOSPHERIC SOURCES OF CARBON MONOXIDE

- ANON: Carbon monoxide changes with the season. New Scientist 56: 625, 1972. Reprint A 187
- DELWICHE C C: Carbon monoxide production and utilization by higher plants. Ann NY Acad Sci 174: 116-21, 1970. A 188
- DOUGLAS E: Carbon monoxide solubilities in sea water. J Phys Chem 71:1931-3, 1967. A 189
- JAFFE L S: Ambient carbon monoxide and its fate in the atmosphere. J Air Pollut Contr Ass 18: 534-40, 1968. A 190
- JAFFE L S: Carbon monoxide in the environment. Sources, characteristics, and fate of atmospheric carbon monoxide. Ann NY Acad Sci 174: 76-88, 1970. A 191
- JUNGE C, SEILER W, BROCK R, GREES K D and RADLER F: Uber die CO-Produktion von mikroorganismen. (Carbon monoxide production of microorganisms). Naturwissenschaften 58: 362-3, 1971. A 192
- MAUGH T H II: Carbon monoxide: Natural sources dwarf man's output. Science 177: 338-9, 1972. A 193
- McMILLAN C and COPE J M: Response to carbon monoxide by geographic variants in acacia farnesiana. Am J Bot 56: 600-2, 1969. A 194
- PICKWELL G V: The physiology of carbon monoxide production by deep-sea coelenterates: causes and consequences. Ann NY Acad Sci 174: 102-5, 1970. A 195
- ROBINSON E and ROBBINS R C: Atmospheric background concentrations of carbon monoxide. Ann NY Acad Sci 174: 89-95, 1970. A 196
- STUPFEL M and GODIN J: Emission d'oxyde de carbone et consommation d'oxygène. (Emission of carbon monoxide and oxygen consumption). C. R. Soc Biol Paris 162: 1684-8, 1969. A 197
- SWINNERTON J W, LINNENBOM V J and LAMONTAGNE R A: The ocean: a natural source of carbon monoxide. Science 167: 984-6, 1970. A 198
- SWINNERTON J W, LINNENBOM V J and LAMONTAGNE R A: Distribution of carbon monoxide between the atmosphere and the ocean. Ann NY Acad Sci 174: 96-101, 1970. A 199
- SWINNERTON J W, LAMONTAGNE R A and LINNENBOM V J: Carbon monoxide in rainwater. Science 172: 943-5, 1971. A 200
- WEINSTOCK B: Carbon monoxide: residence time in the atmosphere. Science 166: 224-5, 1969. A 201
- WEINSTOCK B and NIKI H: Carbon monoxide balance in nature. Science 176: 290-2, 1972. A 202
- WESTBERG K and COHEN N: Carbon monoxide: its role in photochemical smog formation. Science 171: 1013-5, 1971. A 203
- WOLFGANG R: Carbon monoxide as a basis for primitive life on other planets. Nature 225: 876, 1970. A 204

1005051253

ENDOGENOUS ORIGIN OF CARBON MONOXIDE

- | | Reprint |
|--|---------|
| COBURN R F, WILLIAMS W J and KAHN S B : Endogenous carbon monoxide production in patients with hemolytic anemia. <u>J Clin Invest</u> 45: 460-8, 1966. | A 205 |
| COBURN R F : Endogenous carbon monoxide production and body CO stores. <u>Acta Med Scand</u> Suppl 472: 269-82, 1967. | A 206 |
| COBURN R F, WILLIAMS W J, WHITE P and KAHN S B : The production of carbon monoxide from hemoglobin in vivo. <u>J Clin Invest</u> 46: 346-56, 1967. | A 207 |
| COBURN R F : Endogenous carbon monoxide production. <u>New Eng J Med</u> 282: 207-9, 1970. | A 208 |
| COBURN R F : Enhancement by phenobarbital and diphenylhydantoin of carbon monoxide production in normal man. <u>New Eng J Med</u> 283: 512-15, 1970. | A 209 |
| COBURN R F, WALLACE H W and ABBOUD R : Redistribution of body carbon monoxide after hemorrhage. <u>Am J Physiol</u> 220, 868-73, 1971. | A 210 |
| COLTMAN C A Jr, DUDLEY G M III and LEVERETT S D Jr : Measurement of endogenous carbon monoxide production to determine the effect of high $+G_x$ acceleration on the destruction rate of red cells. <u>Aerospace Med</u> 40: 627-31, 1969. | A 211 |
| COLTMAN C A Jr and DUDLEY G M III : The relationship between endogenous carbon monoxide production and total heme mass in normal and abnormal subjects. <u>Am J Med Sci</u> 258: 374-85, 1969. | A 212 |
| DESOILLE H, CASTILLON du PERRON M, CREMER G and LEBBE J : Absence de corrélation entre la pression partielle d'oxygène et l'oxyde de carbone dans le sang. A propos de l'oxycarbonisme endogène décrit par M. Loeper. <u>Arch Mal Prof Paris</u> 24: 603-7, 1963. | A 213 |
| DESOILLE H, CREMER G and GIRARD C : Au sujet d'un prétendu oxycarbonisme d'origine endogène chez les diabétiques. (On the subject of a supposed blood carbon monoxide of endogenous origin in diabetics). <u>Arch Mal Prof Paris</u> 26: 625-30, 1965. | A 214 |
| DRABKIN D L : The hemophagous organ of the placenta and in vitro studies of endogenous carbon monoxide production. <u>Ann NY Acad Sci</u> 174: 49-63, 1970. | A 215 |
| FALLSTROM S P and BJURE J : Endogenous formation of carbon monoxide in newborn infants. II. Rh haemolytic disease of the newborn. <u>Acta Paediat Scand</u> 56: 365-73, 1967. | A 216 |
| FALLSTROM S P and BJURE J : Endogenous formation of carbon monoxide in newborn infants. III. ABO Incompatibility. <u>Acta Paediat Scand</u> 57: 137-44, 1968. | A 217 |
| FALLSTROM S P : Endogenous formation of carbon monoxide in newborn infants. IV. On the relation between the blood carboxyhaemoglobin concentration and the pulmonary elimination of carbon monoxide. <u>Acta Paediat Scand</u> 57: 321-9, 1968. | A 218 |
| FALLSTROM S P : Endogenous formation of carbon monoxide in newborn infants. V. On the relation between the carboxyhaemoglobin concentration and the haemoglobin catabolism calculated from simultaneous determinations of carbon monoxide elimination and total haemoglobin. <u>Acta Paediat Scand</u> 57: 487-94, 1968. | A 219 |
| FALLSTROM S P : On the endogenous formation of carbon monoxide in full-term newborn infants. <u>Acta Paediat Scand</u> Suppl 189: 1-27, 1969. | A 220 |
| LANDAW S A and WINCHELL H S : Endogenous production of carbon-14 labeled carbon monoxide: an in vivo technique for the study of heme catabolism. <u>J Nucl Med</u> 7: 696-707, 1966. | A 221 |
| LANDAW S A : Endogenous production of carbon monoxide: the human body as a cause of air pollution. <u>Ann Int Med</u> 70: 1275-6, 1969. | A 222 |

1005051254

- LANDAW S A : Kinetic aspects of endogenous carbon monoxide production in experimental animals. Ann NY Acad Sci 174: 32-48, 1970. A 223
- LANDAW S A and WINCHELL H S : Endogenous production of ^{14}CO : a method for calculation of RBC life-span in vivo. Blood 36: 642-56, 1970. A 224
- LINDERHOM H and LUNDSTROM P : Endogenous carbon monoxide production and blood loss at delivery. Acta Obstet Gynec Scand 48: 362-70, 1969. A 225
- LOGUE G L, ROSSE W F, SMITH W T, SALTZMAN H A and GUTTERMAN L A : Endogenous carbon monoxide production measured by gas-phase analysis: an estimation of heme catabolic rate. J Lab Clin Med 77: 867-76, 1971. A 226
- LYNCH S R and MOEDE A L : Variation in the rate of endogenous carbon monoxide production in normal human beings. J Lab Clin Med 79: 85-95, 1972. A 227
- MAISELS M J, PATHAK A, NELSON N M, NATHAN D G and SMITH C A : Endogenous production of carbon monoxide in normal and erythroblastotic newborn infants. J Clin Invest 50: 1-8, 1971. A 228
- MARKIEWICZ J : Investigations on endogenous carboxyhaemoglobin. J Forensic Med 14: 16-21, 1967. A 229
- MIYAHARA S and TAKAHASHI H : Carbon monoxide evolution during auto- and enzymatic oxidation of phenols. J Biochem 69: 231-33, 1971. A 230
- PALMA CARLOS A G, PALMA CARLOS M L and SOARES A D : Formation endogène d'oxyde de carbone et catabolisme hémoglobinique. (Endogenous formation of carbon monoxide and hemoglobin catabolism). Nouv Rev Franc Hemat 6: 225-38, 1966. A 231
- SIEGENTHALER P : Formation endogène de monoxyde de carbone associée à la destruction des érythrocytes. Schweiz Med Wschr 95: 1445-6, 1965. A 232
- SJOSTRAND T : Early studies of CO production. Ann NY Acad Sci 174: 5-10, 1970. A 233
- STATHERS G M, HAEGER-ARONSEN B, JONSSON G and MARCIC L : Carbon monoxide in porphyria. Lancet i: 1204, 1968. A 234
- STUFFEL M and ROUSSEL A : Mise en évidence chez la Souris et chez le Rat d'une production endogène d'oxyde de carbone. (Demonstration in the mouse and rat of an endogenous production of carbon monoxide). C R Acad Sci Paris 266: 234-7, 1968. A 235
- STUFFEL M : Le contenu physiologique en oxyde de carbone de l'organisme. (The physiological stores of carbon monoxide in the body). Presse Med 78: 2065-8, 1970. A 236
- WHITE P, COBURN R, WILLIAMS W J, GOLDWEIN M J, ROTHER M L and SHAFER B C : Carbon monoxide production associated with ineffective erythropoiesis. J Clin Invest 46: 1986-98, 1967. A 237
- WHITE P : Carbon monoxide production and heme catabolism. Ann NY Acad Sci 174: 23-31, 1970. A 238
- WRANNE L : Studies on erythro-kinetics in infancy. VII. Quantitative estimation of the haemoglobin catabolism by carbon monoxide technique in young infants. Acta Paediat Scand 56: 381-90, 1967. A 239

1005051255

CARBON MONOXIDES AS AIR POLLUTANT.

- | | Reprint |
|--|---------|
| ABELSON P H : Man-made environmental hazards. I. How man shapes his environment. <u>Am J Public Health</u> 58: 2043-9, 1968. | A 240 |
| AMERICAN THORACIC SOCIETY : Air pollution and health. <u>Am Rev Res Dis</u> 93: 302-12, 1966. | A 241 |
| ANDERSON D O : The effects of air contamination on health: a review. <u>Canad Med Ass J</u> 97: 585-93, 1967. | A 242 |
| ANON : Carbon monoxide - a stealthy killer. <u>Anesth Analg Cleveland</u> 45: 664-8, 1966. | A 243 |
| AYRES S M : The effects of air pollution on health. <u>Delaware Med J</u> 41: 9-14, 1969. | A 244 |
| and
AYRES S M, EVANS R G / BUCHLER M E : Air pollution: A major public health problem. <u>CRC Crit Rev Clin Lab Sci</u> 3: 1-40, 1972. | A 245 |
| CARNOW B W : Air pollution and physician responsibility. <u>Arch Int Med</u> 127: 91-5, 1971. | A 246 |
| CLAYTON G D : Discussion. Carbon monoxide and lead: an environmental appraisal. <u>J Air Pollut Contr Ass</u> 19: 688-9, 1969. | A 247 |
| EISENBUD M and EHRLICH L R : Carbon monoxide concentration trends in urban atmospheres. <u>Science</u> 176: 193-4, 1972. | A 248 |
| ELFIMOVA E V and KHACHATURYAN M K : Features specific to the reflex action of sub-threshold concentrations of sulphurous anhydride in combination with phenol and carbon monoxide in the atmosphere. <u>Gig Sanit</u> 33: 3-6, 1968. | A 249 |
| ENVIRONMENTAL PROTECTION AGENCY: National primary and secondary ambient air quality standards. <u>Fed Reg</u> 36: 8186-8201, 1971. | A 250 |
| EPSTEIN S S : Toxicologic and epidemiologic bases for air quality criteria. <u>J Air Pollut Contr Ass</u> 19: 629-31, 1969. | A 251 |
| FELDSTEIN M : Toxicity and analysis of air pollutants. <u>J Forensic Sci</u> 14: 337-51, 1969. | A 252 |
| GIEVER P M and RUCH W E : Statistical analyses of air pollution sampling frequency in an epidemiologic study. <u>Am Indus Hyg Ass J</u> 32/4: 260-6, 1971. | A 253 |
| GOLDSMITH J R : Environmental epidemiology and the metamorphosis of the human habitat. <u>Am J Pub Health Na Health</u> 57:1532-49, 1967. | A 254 |
| GRUNDY R D : Toxicologic and epidemiologic bases for air quality criteria. Carbon monoxide and lead. Session summary. <u>J Air Pollut Contr Ass</u> 19: 729-32, 1969. | A 255 |
| HEXTER A C and GOLDSMITH J R : Carbon monoxide: association of community air pollution with mortality. <u>Science</u> 172: 265-7, 1971. | A 256 |
| LANGMANN R : Schadklima. (The injurious climate). <u>Hippokrates</u> 35: 588-96, 1964. | A 257 |
| MORROW P E : Adaptations of the respiratory tract to air pollutants. <u>Arch Environ Health</u> 14: 127-36, 1967. | A 258 |
| SCORER R S : Review paper. New attitudes to air pollution - the technical basis of control. <u>Atmos Environ</u> 5: 903-34, 1971. | A 259 |
| SOKOLOVSKY M S, PINCHUK E M and PRAVOVEROV K N : Hygienic assessment of air and microclimate in gas-supplied kitchens. <u>Gig Sanit</u> 32: 16-20, 1967. | A 260 |
| STOKINGER H E : The spectre of today's environmental pollution - USA brand: New perspectives from an old scout. <u>Am Indus Hyg Ass J</u> 30: 195-217, 1969. | A 261 |

1005051256

- TONOMURA M, YAMATE N and TSUJI K : Observations of air pollution with the aid of automatic continuous analysers. II. Relationship among the concentrations of various kinds of pollutants in atmosphere. Bull Nat Inst Hyg Sci Tokyo 85: 35-40, 1967. A 262
- TOYAMA T : Air pollution and its health aspect in Tokyo areas. Asian Med J 11: 5-15, 1968. A 263
- WHO EXPERT COMMITTEE: Atmospheric pollutants. Wld Hlth Org Techn Rep Ser 271: 3 - 16, 1963. A 264
- WHO EXPERT COMMITTEE: Environmental change and resulting impacts on health. Wld Hlth Org Techn Rep Ser 292: 3-24, 1964. A 265
- WHO SCIENTIFIC GROUP: Research into environmental pollution. Wld Hlth Org Techn Rep Ser No. 406: 34-44, 1968. A 266
- WHO EXPERT COMMITTEE: Urban air pollution with particular reference to motor vehicles. Wld Hlth Org Techn Rep Ser 410: 3-53, 1969. A 267
- WHO CHRONICLE: Public health aspects of climate in cities. WHO Chron 25: 161-7, 1971. A 268
- WOLKONSKY P M : Pulmonary effects of air pollution. Arch Environ Health 19: 586-92, 1969. A 269

1005051257

VEHICULAR EXHAUST AS SOURCE OF CARBON MONOXIDE

- ANDERSON D E : Problems created for ice arenas by engine exhaust. Am Ind Hyg Assoc J 32: 790-801, 1971. A 270
- ANON : Air pollution: CO not OK in Europe. Nature (Lond) 227: 3-4, 1970. A 271
- AOYAMA M : Effect of automotive exhaust on the living body. Jap J Clin Pathol 18: 690-693, 1970. A 272
- FISHER R S, MASEMORE W C and SOPHER I M
BAKER S P : Fatal unintentional carbon monoxide poisoning in motor vehicles. Am J Public Health 62: 1463-1467, 1972. A 273
- BARTEK P, GAUME J G and ROSTAMJI H J : Dynamics analysis for time of useful function (TUF) predictions in toxic combusive environments. Aerosp Med 41: 1392-1395, 1970. A 274
- BARTH D S : Federal motor vehicle emission goals for CO, HC and NOx based on desired air quality levels. J Air Pollut Control Assoc 20: 519-524, 1970. A 275
- BLUMER W : Verkehrsabgase als ursache von kopfschmerzen. Praxis 59: 201-209, 1970. A 276
- BOCCADORO S and INGIULLA M : Determinazione dell'ossido di carbonio come indice di inquinamento atmosferico da traffico motorizzato nei negozi e nelle abitazioni del centro di Firenze. Ann Sanita Pubblica 29: 1507-1522, 1968. A 277
- BOVÉ J L and SIEBENBERG S : Airborne lead and carbon monoxide at 45th Street, New York City. Science 167: 986-987, 1970. A 278
- BRANDT A : Über die herabsetzung des CO-gehaltes der auspuffgase von verbrennungsmotoren. Dtsch Gesundheitsw 20: 1202-1206, 1965. A 279
- BRICE R M and ROESLER J F : The exposure to carbon monoxide of occupants of vehicles moving in heavy traffic. J Air Pollut Control Assoc 16: 597-600, 1966. A 280
- BYSTROM G : En okonventionell lösning av parkerings- och kommunikationsproblem inom stadsdelen Orrholmen, Karlstad. Nord Hyg Tidskr 51: 20-24, 1970. A 281
- CAMPBELL J M : A Breath of New York. Science 159: 693-694, 1968. A 282
- CHICHIKALO D I, BENEVELSKY I A and MINSKY I A : On 2 cases of poisoning by carbon monoxide fumes inside automobiles. Cig Sanit 31: 76-77, 1966. A 283
- DUNLAP R : Carbon monoxide: the silent killer. Today's Health 26-27, 67-68, and 71-72, 1961. A 284
- GOLDSMITH J R and ROGERS L H : Health hazards of automobile exhaust. Public Health Report 74: 551-558, 1959. A 285
- GOLDSMITH J R and DEANE M : Outdoor workers in the United States and Europe. Milbank Mem Fund Q 43: 107-116, 1965. A 286
- HAAGEN-SMIT A J : Carbon monoxide levels in city driving. Arch Environ Health 12: 548-551, 1966. A 287
- INGIULLA M, GRASSO C and MARIOTTINI E : Ulteriori determinazioni dell'ossido di carbonio quale indice di inquinamento atmosferico. (Further determinations of carbon monoxide as an indication of atmospheric pollution.) Is Mod 61: 582-591, 1968. A 288

1005051258

- JOHNSON K L, DWORETZKY L H and HELLER A N : Carbon monoxide and air pollution from automobile emission in New York City. Science 160: 67-68, 1968. A 289
- LANDAU E, SMITH R and LYNN D A : Carbon monoxide and lead: an environmental appraisal. J Air Pollut Control Assoc 19: 684-687, 1969. A 290
- LANGMANN R and KETTNER H : Die problematik einer chronischen intoxication durch kohlenoxyd und untersuchungen seiner immissionen in grobstadten. (Problems of chronic carbon monoxide intoxication and studies on the emission in cities). Oeff Gesundheitswes 30: 7-11, 1968. A 291
- LE BRETON R and GARAT J : Intoxications oxycarbonées aiguës provoquées par les clés ou coupe-tirage. (Acute carbon monoxide poisonings caused by valves or dampers). Ann Med Leg (Paris) 44: 366-368, 1964. A 292
- LUDERITZ P : Experimentelle untersuchungen über die wirkungen von kohlenmonoxid aus kraftfahrzeugabgasen auf den gesundheitszustand von verkehrspolizisten. (Experimental studies in the effect of carbon monoxide from automobile exhausts on the health of traffic policemen). Z Gesamte Hyg 17: 645-646, 1971. A 293
- MIRKIN A J : The role of the physician in accident prevention. Arch Environ Health 13: 519-524, 1966. A 294
- MURPHY S D, LENG J K, ULRICH C E and DAVIS H V : Effects on animals of exposure to auto exhaust. Arch Environ Health 7: 60-70, 1963. A 295
- NISHII S : (Effects of air pollution due to automobile exhaust on the human body.) Naika 21: 813-819, 1968. A 296
- PERRELLI G and ROSETTANI E : Criteri di valutazione del rischio ambientale da co. (Criteria of evaluation of the environmental risk from carbon monoxide). Folia Med (Napoli) 47: 1062-1067, 1964. A 297
- PERRELLI G, ROSETTANI E and BRAGUZZI E : Valutazione del rischio negli esposti all'in-alazione di piccole quantità di ossido di carbonio. (Evaluation of the risk in exposure to inhalation of small quantities of carbon monoxide). Minerva Med 56: 3477-3479, 1965. A 298
- PETROVA A, DALAKMANSKI Y and BAKALOV D : Study of contamination of the atmosphere by injurious road transport and industrial products. J Hyg Epidemiol Immunol (Praha) 10: 383-391, 1966. A 299
- RAMSEY J M : Concentrations of carbon monoxide at traffic intersections in Dayton, Ohio. Arch Environ Health 13: 44-46, 1966. A 300
- RAUSA G, PERIN G and DIANA L : Inquinamento da ossido di carbonio, piombo e ossidi di azoto in una autorimessa a più piani del Veneto. (Air pollution with carbon monoxide, lead and nitrogen oxides in an automobile parking garage several stories high in Venetia). Riv Ital Ig 27: 402-422, 1967. A 300
- RAYFIELD J D : Field testing program for carbon monoxide. J Med Assoc State Ala 36: 1494-1502, 1967. A 301
- REED L E and TROTT P E : Continuous measurement of carbon monoxide in streets 1967-1969. Atmos Environ 5: 27-39, 1971. A 302
- RISPLER L and ROSS C R : Ventilation for engine exhaust gases. Occup Health Rev 17: 19-22, 1965. A 303
- RONDIA D, GUYAUX J and HEUSGHIEM C : Concentration de l'oxyde de carbone dans les rues, à Liège. (Concentration of carbon monoxide in the streets of Liège). Arch Belg Med Soc 24: 73-87, 1966. A 304

1005051259

- SFORZOLINI G S and SAVINO A : Azione dell'ozono su alcuni indici chimici di inquinamento degli ambienti confinati. (Action of ozone on several chemical indices of air pollution in closed areas). Riv Ital Ig 29-30: 174-188, 1970, Italian. A 305
- SHOJI H, YAMAMOTO T, NISHIDA K, ISHIKAWA Y, TAKADA S and INOUE K : (Studies on air pollution owing to the automobile exhaust gases. The concentrations of C1-C6 hydrocarbons and some inorganic gases in the exhaust gases). Jap J Hyg 22: 341-353, 1967. A 306
- SILVER H M : Carbon monoxide in health and politics. Med Ann DC 40: 169-171, 1971. A 307
- SPINAZZOLA A, MARRACCINI L, DEVOTO G and ZEDDA S : Studio sul comportamento di alcuni prodotti tossici volatili quale indice di inquinamento atmosferico nella città di Cagliari. (Study of the behavior of some volatile toxic products as indices of air pollution in the city of Cagliari. V. Carbon monoxide). Folia Med (Napoli) 49: 659-668, 1966. A 308
- TROMPEO G, TURLETTI G and GIARRUSSO O T : Concentrazioni di CO nelle autorimesse interrato. (Concentrations of CO in underground garages). Rass Med Industr 33: 392-393, 1964. A 309
- UBISCH H and WESTERLUND K : The concentration of carbon monoxide in a city building and in underground garages. Nord Hyg Tidskr 52: 48-51, 1971. A 314
- UMEZAWA T : (Air pollution and blood gases). Naika 21: 836-840, 1968, (Jap.). A 310
- VEIL C : L'attitude épidémiologique. (The epidemiologic attitude). Evol Psychiatr (Paris) 33: 253-262, 1968. A 311
- VOORHOEVE R J H, REMEIK A J P, FREELAND P E and MATTHIAS B T : Rare-earth oxides of manganese and cobalt rival platinum for the treatment of carbon monoxide in auto exhaust. Science 177: 353-354, 1972. A 312
- WEAVER N K : Toxicologic implications of motor gasoline and auto emissions. Ind Med Surg 40: 31-34, 1971. A 313
- WIETHAUP H : Zum anteil der autoabgase an der luftverunreinigung. (On the role of automobile exhausts in air pollution). Med Klin 63: 1088-1089, 1968. (Ger) A 315
- WOODRUFF P S : Environmental pollution-nuisance, menace or disaster? Med J Aust 1: 1162-1167, 1970. A 316
- YAMATE N and MATSUMURA T : (Summary of carbon monoxide levels during the past six years (1964-1969) at three air monitoring stations in Tokyo). Bull Natl Inst Hyg Sci (Tokyo) 89: 107-111, 1971. A 317

1005051260

Additional Bibliography List No. 9

ANALYSIS OF CARBON MONOXIDE IN THE AIR

- | | Reprint |
|--|---------|
| AJEMIAN R S and WHITMAN N E : Monitoring carbon monoxide in ambient air. <u>J Air Pollut Contr Ass</u> 20: 310-1, 1970. | A 318 |
| ANON : Tentative method of analysis for methane and carbon monoxide content of the atmosphere (gas chromatographic method by reduction to methane). <u>Health Lab Sci</u> 9: 58-61, 1972. | A 319 |
| AUBEAU R, LEROY J and CHAMPEIX L : Influence du degré d'hydratation de l'adsorbant sur l'analyse chromatographique des gaz permanents. (Influence of degree of hydration of the adsorbent on the chromatographic analysis of permanent gases.) <u>J Chromatogr</u> 19: 249-62, 1965. | A 320 |
| BARRETT J C, BENNETT R and BUCKMASTER J : Automatic carbon monoxide monitor. <u>Am Industr Hyg Ass J</u> 27: 402-6, 1968. | A 321 |
| BLANC C, HUYNH C T and ESPAGNO L : Enrichissement des isotopes du carbone et du néon par chromatographie en phase gazeuse. 1ère partie. (Enrichment of carbon and neon isotopes by gas phase chromatography.) <u>J Chromatogr</u> 28: 177-93, 1967. | A 322 |
| BOTTEAU H L and MOUSSION C : Un appareil simple pour le dosage de quelques toxiques gazeux ou volatils. (A simple apparatus for the determination of various gaseous or volatile poisons.) <u>Ann Biol Clin(Paris)</u> 25: 215-27, 1967. | A 323 |
| CELEGIN M, HANSSON R and SUNDSTROM G : A sub-microliter sampling device for quantitative collection of gases. Application to 'gas chromatographic' analysis. <u>Scand Clin Lab Invest</u> 27: 367-70, 1971. | A 324 |
| CIUHANDU G, DIACONOVICI M, KISS L and RUSU V : Bestimmung des ausgeatmeten Kohlenmonoxyds. (Determination of exhaled carbon monoxide.) <u>Hoppe Seyler Z Physiol Chem</u> 339: 104-9, 1964. | A 325 |
| CIUHANDU G and RUSU V : Photometrische Mikrobestimmung von Kohlenmonoxid in Luft und Blut. (Photometric microdetermination of carbon monoxide in air and blood.) <u>Z Klin Chem Biochem</u> 6: 204-8, 1968. | A 326 |
| CLARK J C and BUCKINGHAM P D : The preparation and storage of carbon-11 labelled gases for clinical use. <u>Int J Appl Radiat Isot</u> 22: 639-46, 1971. | A 327 |
| DAVIES G M, JONES J G and WARNER C G : A continuously recording atmospheric carbon monoxide monitoring system with fully automatic alarms in a blast furnace area. <u>Brit J Industr Med</u> 22: 270-8, 1965. | A 328 |
| DUBOIS L, ZDROJEWSKI A and MONKMAN J L : The analysis of carbon monoxide in urban air at the ppm level, and the normal carbon monoxide value. <u>J Air Pollut Contr Ass</u> 16: 135-9, 1966. | A 329 |
| DUBOIS L and MONKMAN J L : Continuous determination of carbon monoxide by frontal analysis. <u>Anal Chem</u> 44: 74-6, 1972. | A 330 |
| DUCROS H : Epuration de l'oxyde de carbone par l'hopcalite dans une enceinte close. (Purification of carbon monoxide by hopcalite in a closed environment.) <u>Rev Corps Sante Armées</u> 9: 645-64, 1968. | A 331 |
| FELDSTEIN M : The colorimetric determination of blood and breath carbon monoxide. <u>J Forensic Sci</u> 10: 35-42, 1965. | A 332 |

1005051261

Additional Bibliography List No. 9

- FELDSTEIN M: Methods for the determination of carbon monoxide. Prog Chem Toxic 3: 99-119, 1967. A 333
- GORODINSKY S M, LEVINSKY S V and SCHERBAKOV V L: (Determination of standard values of noxious admixtures in the use of insulating respiratory apparatus.) Gig Sanit 32: 42-7, 1967. A 334
- IABLOCHKIN V D: (A modified method of photoelectrocolorimetric determination of carbon monoxide in the decomposition products of several polymers.) Gig Sanit 31: 59-62, 1966. A 335
- KIM T S and RYO U Y: A modified chemical analysis for carbon monoxide in respiratory gases. J Lab Clin Med 67: 873-8, 1966. A 336
- KUNZ C, DONDES S and HARTECK P: A spectroscopic study of the alpha-ray-induced luminescence in gases; the helium-carbon monoxide system. Radiat Res 41: 288-98, 1970. A 337
- LINCH A L and PFAFF H V: Carbon monoxide - evaluation of exposure potential by personnel monitor surveys. Am Industr Hyg Ass J 32: 745-52, 1971. A 338
- MCDOWELL R S: Metal carbonyl vapors: rapid quantitative analysis by infrared spectrophotometry. Am Industr Hyg Ass J 32: 621-4, 1971. A 339
- McFEE D R, LAVINE R E and SULLIVAN R J: Carbon monoxide, a prevalent hazard indicated by detector tabs. Am Industr Hyg Ass J 31: 749-53, 1970. A 340
- MOKHOV L A and CHUIKOVA N J: (On assessing the results of determining carbon monoxide in the air.) Lab Delo 4: 225-7, 1967. A 341
- MORGANSTERN A S, ASH R M and LYNCH J R: The evaluation of gas detector tube systems: I. Carbon monoxide. Am Industr Hyg Ass J 31: 630-2, 1970. A 342
- PIERCE J O and COLLINS R J: Calibration of an infrared analyzer for continuous measurement of carbon monoxide. Am Industr Hyg Ass J 32: 457-62, 1971. A 343
- RAMSEY J M: Potassium pallado sulfite detection of carbon monoxide in exhaled air as an estimate of carboxyhemoglobin. Am Industr Hyg Ass J 28: 531-4, 1967. A 344
- ROBBINS R C, BORG K M and ROBINSON E: Carbon monoxide in the atmosphere. J Air Pollut Contr Ass 18: 106-10, 1968. A 345
- RODKEY F L: Discussion: Carbon monoxide estimation in gases and blood by gas chromatography. Ann NY Acad Sci 174: 261-7, 1970. A 346
- SANZ RAMOS PEDRERO P and RODRIGO P: La toxicología del óxido de carbono con las técnicas para su determinación. Un nuevo método polarográfico para la evaluación en sangre y en el ambiente. (The toxicology of carbon monoxide with the new technics for its determination. A new polarographic method for its evaluation in the blood and in the air.) An Acad Farm(Madrid) 30: 228-59, 1964. A 347
- SEMAR M, TRESER G and LANGE K: Quantitative comparative immunohistology. Clin Chim Acta 15: 505-15, 1967. A 348
- SILVERMAN L and GARDNER G R: Potassium pallado sulfite method for carbon monoxide detection. Am Industr Hyg Ass J 26: 97-105, 1965. A 349
- SLATER K: Notes on experimental technique and apparatus. The detection and measurement of dangerous quantities of carbon monoxide gas. J Sci Instrum 44: 642-3, 1967. A 350
- SMITH R G, BRYAN R J, FELDSTEIN M, LEVADIE B, MILLER F A, STEPHENS E R and WHITE N G: Tentative method of continuous analysis for carbon monoxide content of the atmosphere (nondispersive infrared method). Health Lab Sci 7: Suppl:81-6, 1970. A 351

1005051262

Additional Bibliograph List No. 9

- SMITH R G, BRYAN R J, FELDSTEIN M, LEVADIE B, MILLER F A, STEPHENS E R and WHITE N G: Tentative method for preparation of carbon monoxide standard mixtures. Health Lab Sci 7: Suppl: 72-4, 1970. A 352
- SMITH R G, BRYAN R J, FELDSTEIN M, LEVADIE B, MILLER F A, STEPHENS E R and WHITE N G: Tentative method of analysis for carbon monoxide content of the atmosphere (manual- colorimetric method). Health Lab Sci 7: Suppl: 75-7, 1970. A 353
- SMITH R G, BRYAN R J, FELDSTEIN M, LEVADIE B, MILLER F A, STEPHENS E R and WHITE N G: Tentative method of analysis for carbon monoxide content of the atmosphere (infrared absorption method). Health Lab Sci 7: Suppl: 78-80, 1970. A 354
- SMITH R G, BRYAN R J, FELDSTEIN M, LEVADIE B, MILLER F A, STEPHENS E R and WHITE N G: Tentative method of analysis for carbon monoxide content of the atmosphere (hopcalite method). Health Lab Sci 9: 84-7, 1972. A 355
- SMITH T C: Carbon monoxide, neon, and acetylene analysis in the presence of anesthetic gases. J Appl Physiol 21: 745-6, 1966. A 356
- STAMM E: Eine photometrische Methode zur Bestimmung kleiner CO-Mengen in der Luft. (A photometric method for the determination of small CO quantities in the air.) Z Ges Hyg 13: 160-3, 1967. A 357
- VANNESTE W H: A radiochemical method for determination of carbon monoxide in chemical combination. Anal Biochem 15: 65-76, 1966. A 358
- WEASE D F : An automated, closed system for gas analysis. Assay of carbon monoxide in blood. US Air Force Sch Aerospace Med 1-12, 1967. A 359
- XINTARAS C, JOHNSON B L, ULRICH C E, TERRILL R E and SOBECKI M F: Application of the evoked response technique in air pollution toxicology. Toxicol Appl Pharmacol 8: 77-87, 1966. A 360

1005051263

CARBON MONOXIDE USE FOR MEASURING PULMONARY DIFFUSION CAPACITY

- AYRES S M, BUEHLER M E and ARMSTRONG R G : Diffusing capacity of the lung in pulmonary emphysema. J Appl Physiol 19: 981-9, 1964. A 361
- BATES D V, CHRISTIE R V and VARVIS C J : The measurement of the pulmonary capillary blood volume and membrane diffusion component on exercise. J Physiol London 154: 13P-14P, 1960. A 362
- BEDELL G N and OSTIGUY G L : Transfer factor for carbon monoxide in patients with airways obstruction. Clin Sci 32: 239-48, 1967. A 363
- BEEREL F R and VANCE J W : Daily P_{CO_2} and pH fluctuations in pulmonary emphysema with carbon dioxide retention. Am Rev Resp Dis 92: 894-9, 1965. A 364
- BEUMER H M : Determination of the transfer factor and half time of carbon monoxide during apnea in the human lungs in normal and pathological cases. Med Thorac 21: 204-22, 1964. A 365
- BEUMER H M : De Bepaling van de diffusiecapaciteit van de longen met Behulp van Koolmonoxyde. (The determination of the diffusion capacity of the lungs with the aid of carbon monoxide.) Nederl Milit Geneesk T 18: 89-102, 1965. A 366
- BJURE J : Pulmonary diffusing capacity for carbon monoxide in relation to cardiac output in man. Scand J Clin Lab Invest 17: Suppl 81: 1-113, 1965. A 367
- BOLLINELLI R, ROUCH Y, PUJOL M, CARRIERE R and CARLES P : Interet du test au CO en etat stable, dans le depistage de la bronchite chronique, en medecine du travail. (Importance of the steady-state CO diffusion test in the detection of chronic bronchitis in industrial medicine.) Med Lav 62: 101-10, 1971. A 368
- BOOZ J : Fréquence ventilatoire et "capacité de diffusion" de l'oxyde de carbone mesurée en "steady state". (Ventilatory and diffusion capacity of carbon monoxide measured at steady state.) Arch Int Physiol 77: 939-43, 1969. A 369
- BOUHUYS A, GEORG J, JÖNSSON R, LUNDIN G and LINDELL S E : The influence of histamine inhalation on the pulmonary diffusing capacity in man. J Physiol 152: 176-81, 1960. A 370
- BURGESS J H, GILLESPIE J, GRAF P D and NADEL J A : Effect of pulmonary vascular pressures on single-breath CO diffusing capacity in dogs. J Appl Physiol 24: 692-6, 1968. A 371
- CANEPA F, CAVALLO F and MUZIO M : Aspetti tecnici di funzione respiratoria: descrizione di un apparecchio per la determinazione successiva della meccanica respiratoria della diffusione polmonare del CO. (Technical aspects of respiratory function: description of an apparatus for successive determination of respiratory mechanics of pulmonary diffusion of CO.) Arch Maragliano Pat Clin 24: 359-63, 1968. A 372
- CASULA D, NISSARDI G P, SANNA-RANDACCIO F and FRAU P : Ricerche sugli scambi respiratori nella silicosi polmonare. III. Studio delle correlazioni esistenti fra PaO_2 e "trasfert" del CO. (Research on respiratory exchanges in pulmonary silicosis. Study of the correlation between PaO_2 and "transfer" of CO.) Boll Soc Ital Biol Sper 45: 1290-2, 1969. A 373
- CASULA D, NISSARDI G P, SANNA-RANDACCIO F and FRAU P : Ricerche sugli scambi respiratori nella silicosi polmonare. IV. Studio delle correlazioni esistenti fra SaO_2 "transfert" del CO. (Research on respiratory exchanges in pulmonary silicosis. IV. Study of the correlations between SaO_2 and "transfer" of CO.) Boll Soc Ital Biol Sper 45: 1292-3, 1969. A 374

1005051264

- CHINET A, MICHELI J L and HAAB P : Inhomogeneity effects on O_2 and CO pulmonary diffusing capacity estimates by steady-state methods. *Theory. Res Physiol* 13: 1-22, 1971. A 375
- CINKOTAI F F and THOMSON M L : Diurnal variation in pulmonary diffusing capacity for carbon monoxide. *J Appl Physiol* 21: 539-42, 1966. A 376
- CIUHANDU G, DIACONOVICI M, KISS L and RUSU V : Die Beziehung zwischen Kohlenmonoxidausscheidung in der Ausatemluft und beruflicher Exposition. (Relationship between carbon monoxide exhalation in the breath and occupational exposure.) *Z Arbeitsmed* 18: 172-6, 1968. A 377
- COTES J E, DABBS J M, EVANS M R and HOLLAND P : Effect of CS aerosol upon lung gas transfer and alveolar volume in healthy men. *Q J Exp Physiol* 57: 199-206, 1972. A 378
- DALY W J and WALDHAUSEN J A : Physiologic studies of the pulmonary capillary bed after barium sulfate embolization. *J Clin Invest* 46: 1617-24, 1967. A 379
- DALY W J : Pulmonary diffusing capacity for carbon monoxide and topography of perfusion during changes in alveolar pressure in man. *Am Rev Resp Dis* 99: 548-53, 1969. A 380
- DALLE M, TOURNAIRE C, BRUDIEUX R and DELOST P : Évolution néo-natale des corticostéroïdes surrénaliens et plasmatiques chez le Cobaye. (Comparative study of respiratory dead space simultaneously measured with CO and CO_2 .) *J Physiol (Paris)* 63: 34A, 1971. A 381
- DeGRAFFA A C Jr, TAYLOR H F, ORD J W, CHUANG T H and JOHNSON R L Jr : Exercise limitation following extensive pulmonary resection. *J Clin Invest* 44: 1514-22, 1965. A 382
- FLETCHER E C : A nomogram for the transfer factor for carbon monoxide in the lungs. *Thorax* 27: 382-5, 1972. A 383
- FORBES W H, SARGENT F and ROUGHTON F J W : The rate of carbon monoxide uptake by normal men. *Am J Physiol* 143: 594-608, 1945. A 384
- FORBES W H : Carbon monoxide uptake via the lungs. *Ann NY Acad Sci* 174: 72-5, 1970. A 385
- FORSTER R E, ROUGHTON F J W, CANDLER L, BRISCOE W A and KREUZER F : Apparent pulmonary diffusing capacity for CO at varying alveolar O_2 tensions. *J Appl Physiol* 11: 277-89, 1957. A 386
- FREYSCHUSS U and HOLMGREN A : On the variation of D_{LCO} with increasing oxygen uptake during exercise in healthy ordinarily untrained young men and women. *Acta Physiol Scand* 65: 193-206, 1965. A 387
- GABRIEL S : On the prediction of pulmonary diffusing capacity with a steady state carbon monoxide method in chronic lung diseases. *Scand J Clin Lab Invest* 24: 377-81, 1969. A 388
- GATTO E, CANEPA F, CAVALLO F and MASSIMILIA A : La diffusione polmonare del monossido di carbonio in soggetti normali. (Pulmonary diffusion of carbon monoxide in the normal subject.) *Arch Maragliano Pat Clin* 23: 699-706, 1967. A 389
- GERHARDT T, GOTHERT M, MALORNY G and WILKE H : Aufnahme von Kohlenoxid in den Organismus des Menschen bei Atmung von CO-Luftgemischen unter erhöhtem Druck. (Carbon monoxide uptake in human beings breathing CO-air mixtures under increased pressure.) *N Schmied Arch Pharmacol* 266: 332-3, 1970. A 390
- GULERIA J S, PANDE J N, SEITHI P K and ROY S B : Pulmonary diffusing capacity at high altitude. *J Appl Physiol* 31: 536-43, 1971. A 391
- GULZOW M : Die Kohlenoxydgasvergiftung. (Poisoning by carbon monoxide gas.) *Z Aerztl Fortbild* 51: 838-41, 1957. A 392

1005051265

- GUYATT A R, NEWMAN F, CINKOTAL F F, PALMER J I and THOMSON M L: Pulmonary diffusing capacity in man during immersion in water. J Appl Physiol 20: 878-81, 1965. A 393
- HAAB P, ROBERT M and FIPER J: Comparaison de la capacité de diffusion pulmonaire du Chien narcotisé mesurée simultanément par l'oxygène et le monoxyde de carbone. (Comparison of the pulmonary diffusion capacity of anesthetized dogs measured simultaneously by oxygen and carbon monoxide.) J Physiol Paris 60 Suppl 2: 455-6, 1968. A 394
- HAMILTON L H and KERSTING D J: A study of gas analysis for measurement of pulmonary diffusing capacity for carbon monoxide by chromatographic techniques. Am Rev Resp Dis 102: 916-20, 1970. A 395
- HAMM J: Diffusionskapazität. (Diffusion capacity.) Beitr Klin Erforsch Tuberk 133: 292-304, 1966. A 396
- HATZFELD C, WIENER F and BRISCOE W A: Effects of uneven ventilation - diffusion ratios on pulmonary diffusing capacity in disease. J Appl Physiol 23: 1 - 10, 1967. A 397
- HILPERT P: Die Änderung der Diffusionskapazität der Lunge für CO durch die Hämoglobinkonzentration des Blutes. (Variation of the carbon monoxide diffusing capacity of the lung with the hemoglobin concentration of the blood.) Respiration 28: 518-25, 1971. A 398
- HOLMGREN A: On the reproducibility of steady state D_{LCO} measurements during exercise in man. Scand J Clin Lab Invest 17: 110-6, 1965. A 399
- HOLMGREN A: On the significance of pulmonary mean capillary CO back pressure corrections for repeated measurements of D_{LCO} during exercise in man. Scand J Clin Lab Invest 17: 117-22, 1965. A 400
- HOLMGREN A: On the significance of validity and precision in the determination of alveolar carbon dioxide tension for measurements of alveolar ventilation and D_{LCO} . Scand J Clin Lab Invest 17: 123-9, 1965. A 401
- HOLMGREN A: On the variation of D_{LCO} with increasing oxygen uptake during exercise in healthy trained young men and women. Acta Physiol Scand 65: 207-20, 1965. A 402
- HSIEH Y C, ROSS J C, SMALL G R and THOMPSON E C: Effect of limb vascular occlusion on pulmonary diffusing capacity (D_{LCO}) during rest and leg exercise. Am J Med Sci 256: 9-17, 1968. A 403
- HYDE R W, MARIN M G, RYNES R I, KARREMAN G and FORSTER R E: Measurement of uneven distribution of pulmonary blood flow to CO diffusing capacity. J Appl Physiol 31: 605-12, 1971. A 404
- JAMES F and RUMBLE L Jr: Carbon monoxide diffusing studies in the clinical evaluation of chronic lung diseases. Dis Chest 52: 387-91, 1967. A 405
- JOHNSON R L Jr, TAYLOR H F and LAWSON W H Jr: Maximal diffusing capacity of the lung for carbon monoxide. J Clin Invest 44: 349-55, 1965. A 406
- JOHNSON R L Jr, TAYLOR H F and DeGRAFF A C Jr: Functional significance of a low pulmonary diffusing capacity for carbon monoxide. J Clin Invest 44: 789-800, 1965. A 407
- JOHNSON R L Jr and MILLER J M: Distribution of ventilation, blood flow, and gas transfer coefficients in the lung. J Appl Physiol 25: 1-15, 1968. A 408
- KANAZIRSKY P, TSANEV B and GEORGIEV G: (Diffusion capacity of lungs for carbon monoxide.) Surv Med(Sofia) 16: 614-9, 1965. A 409
- KAWAMOTO T: (A study of CO diffusing capacity with reference to pulmonary hemodynamics and ventilatory functions in patients with cardiac or chronic pulmonary disease.) Jap Circ J 30: 251-65, 1966. A 410

1005051266

- KOTTER D, HUCH A, STOTZ H and PIIPER J : Single breath CO diffusing capacity in anesthetized dogs with increased oxygen consumption. Resp Physiol 6: 202-8, 1969. A 411
- KRAL B, CERNOCHOVA Z and TUSL M : Diffusing capacity of the lungs for CO and its components in healthy men of different age at rest and in physical load. Sborn Ved Prac Lek Fak Karlov Univ 9: 625-9, 1966. A 412
- KREUKNIET J and VISSER B F : The pulmonary CO diffusing capacity according to Bates and according to Filley in patients with unequal ventilation. Pflueg Arch Ges Physiol 281: 207-11, 1964. A 413
- KREUZER F and CAMPAGNE P L : Resting pulmonary diffusing capacity for CO and O₂ at high altitude. J Arr. Physiol 20: 519-22, 1965. A 413a
- LACOSTE J and ROUCH Y : Mesures simultanées chez l'Homme de l'efficacité des échanges pulmonaires pour le CO₂ et le CO avec addition d'un espace mort. (Simultaneous measurements in humans of the efficiency of pulmonary exchanges for CO₂ and CO with addition of a dead space.) C R Soc Biol(Paris) 160: 1667-70, 1966. A 414
- LACOSTE J : Exploration fonctionnelle respiratoire. La ductance DuCO (monoxyde de carbone): évaluation globale, non sanglante, de l'échangeur pulmonaire. (Functional respiratory investigations. Ductance of CO (carbon monoxide): global estimation of pulmonary exchanger, omitting blood tests.) Presse Med 79: 1781-4, 1971. A 415
- LAWSON W H Jr : Rebreathing measurements of pulmonary diffusing capacity for CO during exercise. J Appl Physiol 29: 896-900, 1970. A 416
- LAWSON W H Jr : Effect of drugs, hypoxia, and ventilatory maneuvers on lung diffusion for CO in man. J Appl Physiol 32: 788-94, 1972. A 417
- LEWIS C M and BRINK A J : Carbon monoxide diffusion of lungs in assessment of pulmonary blood flow in patients with intracardiac shunts. Brit Heart J 28: 359-65, 1966. A 418
- LO COCO A : Sul comportamento della capacità di diffusione per il monossido di carbonio in due gruppi di soggetti, affetti da tubercolosi polmonare e da broncopatia cronica ostruttiva. (Behavior of diffusion capacity for carbon monoxide in 2 groups of subjects with pulmonary tuberculosis and chronic obstructive bronchopathy.) G Ital Mal Torace 24: 27-30, 1970. A 419
- LOPEZ-MAJANO V : Reproducibility of the carbon monoxide diffusion capacity method. Respiration 28: 114-9, 1971. A 420
- MAUDERLY J L : Steady-state carbon monoxide-diffusing capacity of unanesthetized Beagle dogs. Am J-Vet Res 33: 1485-91, 1972. A 421
- MÄHRLEIN W, KRAUSE M and MÜLLER H R : Apnoetechnik zur Bestimmung der pulmonalen Diffusionskapazität für Kohlenmonoxid. (Apnea technic for the determination of the pulmonary diffusion capacity of carbon monoxide.) Z Ges Med 22: 373-5, 1967. A 422
- MENKES H A, SERA K, ROGERS R M, HYDE R W, FORSTER R E II and DuBOIS A B : Pulsatile uptake of CO in the human lung. J Clin Invest 49: 335-45, 1970. A 423
- MITCHELL M M and RENZETTI A D Jr : Application of the single-breath method of total lung capacity measurement to the calculation of the carbon monoxide diffusing capacity. Am Rev Resp Dis 97: 581-4, 1968. A 424
- MITTMAN C : Nonuniform pulmonary diffusing capacity measured by sequential CO uptake and washout. J Appl Physiol 23: 131-8, 1967. A 425
- NAIRN J R, POWER G G, HYDE R W, FORSTER R E, LAMBERTSEN C J and DICKSON J : Diffusing capacity and pulmonary capillary blood flow at hyperbaric pressures. J Clin Invest 44: 1591-9, 1965. A 426

1005051267

- NISSARDI G P, SANNA-RANDACCIO F, TORRAZZA P L and CASCIU G: Ricerche sulla capacità di diffusione alveolo-capillare per il CO (DCO). I. Comportamento della D_{CO} nei silicotici in condizioni di riposo. (Research on the alveolo-capillary diffusion capacity for CO (D CO). I. Behavior of D CO in silicotics at rest.) Boll Soc Ital Biol Sper 41: 866-70, 1965. A 427
- NISSARDI G P, SANNA-RANDACCIO F, TORRAZZA P L and GARIEL G: Ricerche sulla capacità di diffusione alveolo-capillare per il CO (D CO). II. Modificazioni della D CO nei silicotici nel corso del lavoro muscolare. (Research on the alveolo-capillary diffusion capacity for CO (D CO). II. Changes in D CO in silicotics during muscular work.) Boll Soc Ital Sper 41: 870-4, 1965. A 428
- NISSARDI G P, TORRAZZA P I and ANEDDA G: Ricerche sulla capacità di diffusione per il monossido di carbonio. Effetto del broncospasmo indotto mediante aerosol di acetilcolina. (Research on the diffusion capacity for carbon monoxide. Effect of bronchospasm induced with acetylcholine aerosol.) Boll Soc Ital Biol Sper 43: 130-4, 1967. A 429
- NISSARDI G P, SANNA-RANDACCIO F and SARNA R: Ricerche sulla capacità di diffusione nei silicotici rapporto tra D CO e alterazioni ventilatorie. (Research on diffusion capacity in silicotics. Relation between D CO and ventilatory changes.) Boll Soc Ital Biol Sper 44: 75-80, 1968. A 430
- PAEZ P N: Carbon monoxide levels in patients with chronic obstructive pulmonary disease. (COPD). Chest 58: 287, 1970. A 431
- PIPER J and SIKAND R S: Determination of D CO by the single breath method in inhomogeneous lungs: Theory. Resp Physiol 1: 75-87, 1966. A 432
- PIPER J, PFEIFER K and SCHEID P: Carbon monoxide diffusing capacity of the respiratory system in the domestic fowl. Resp Physiol 6: 309-17, 1969. A 433
- PIRNAY F, FASSOTTE A, GAZON J, DEROANNE R and PETIT J M: Diffusion pulmonaire au cours de l'exercice musculaire. Int Z Angew Physiol 28: 31-7, 1969. A 434
- PIRNAY F, PETIT J M and ROBERTS M: Evolution de la capacité de transfert du CO pendant le bronchospasme provoqué. (Development of the CO transfer capacity during induced bronchospasm.) Acta Tuberc Pneumol Belg 61: 95-9, 1970. A 435
- PODLESCH I and STEVANOVIC M: Die Altersabhängigkeit der Diffusionskapazität der Lunge in Ruhe und während Belastung. (Effect of age on the pulmonary diffusion capacity at rest and during exercise.) Med Thorac 23: 144-59, 1966. A 436
- POWER G G Jr, HYDE R W, SEVER R J, HOPPIN F G Jr and NAIRN J R: Pulmonary diffusing capacity and capillary blood flow during forward acceleration. J Appl Physiol 20: 1199-204, 1965. A 437
- POWER G G, AOKI V S, LAWSON W H Jr and GREGG J B: Diffusion characteristics of pulmonary blood-gas barrier at low temperatures. J Appl Physiol 31: 438-46, 1971. A 438
- RANDOWA D and SIERAWSKI S: Oznaczanie pojemności dyfuzyjnej płuc za pomocą tlenku węgla (metoda pojedynczego oddechu) w przewlekłych chorobach płuc. (Determination of the diffusion capacity of the lung with aid of carbon monoxide (single respiration method) in chronic lung diseases.) Pol Tyg Lek 19: 829-31, 1964. A 439
- RANDOWA D: Zaburzenia dyfuzji w przewlekłych chorobach płuc (metoda tlenkowęgłowa). (Disturbances in diffusion in chronic pulmonary diseases (carbon monoxide method).) Gruzlica 35: 465-72, 1967. A 440
- REMMERS J E and MITHOEFER J C: The carbon monoxide diffusing capacity in permanent residents at high altitudes. Resp Physiol 6: 233-44, 1969. A 441

1005051268

Additional Bibliography List No. 10

- SANNA-RANDACCIO F and NISSARDI G P : L'influenza della ventilazione sulla misura del 'trasferimento' del CO in stato stabile. (Influence of ventilation on the measurement of 'transfer' of CO in stable state.) Boll Soc Ital Biol Sper 45: 762-5, 1969. A 442
- SARTORELLI E : Alterazioni della diffusione alveolo-capillare del CO nella silicosi. (Changes in alveolo-capillary diffusion of CO in silicosis.) Acta Geront (Milano) 17: 182-6, 1967. A 443
- SATAKE T, HIDA S, USUI A, TATSUBANA K, YAMAZAKI J and MATSUOKA T : (Studies on the measurement of the carbon monoxide diffusing capacity by the single-breath method, with special reference to the influence of the uneven distribution of ventilation-perfusion of the lungs.) Jap Circ J 32: 35-40, 1968. A 444
- SHAW D B, CINKOTAI F and THOMSON M L : Syncope induced by application of negative pressure to the lower body and its effect on lung CO diffusing capacity. Aerospace Med 37: 154-7, 1966. A 445
- SIKAND R S and PIIPER J : Pulmonary diffusing capacity for CO in dogs by the single breath method. Resp Physiol 1: 172-92, 1966. A 446
- SIMONE M, REGGIANI A and BET E : La capacità di diffusione per il monossido di carbonio nella valutazione preoperatoria. (Carbon monoxide diffusion capacity in preoperative evaluation.) Acta Anaesth (Padova) 16: Suppl 4: 103-14, 1965. A 447
- STEINER S H, FRAYSER R and ROSS J C : Alterations in pulmonary diffusing capacity and pulmonary capillary blood volume with negative pressure breathing. J Clin Invest 44: 1623-30, 1965. A 448
- TARTULIER M, TOURNIAIRE A, DEYRIEUX F and BLUM J : Étude de transfert alvéolo-capillaire de l'oxyde de carbone dans la sténose mitrale. (Study of alveolo-capillary transfer of carbon monoxide in mitral stenosis.) Arch Mal Coeur 60: 843-64, 1967. A 449
- TLUSTÝ L, HLOUŠKOVÁ Z, KROFTA K and DAUM S : Difúzní kapacita plicni pro CO, vyšetřena metodou 'steady state' a metodou 'single breath'. (Pulmonary diffusing capacity for CO examined by 'steady state' and 'single breath' method.) Cas Lek Cesk 111: 149-53, 1972. A 450
- TRINQUET G, CLAUZEL A M, CARRÉ R and MEYER A : Les valeurs du transfert de l'oxyde de carbone chez l'homme normal en état ventilatoire stable au repos. (Values for carbon monoxide transfer in normal humans in stable ventilatory state at rest.) J Franc Med Chir Thorac 21: 365-82, 1967. A 451
- VANDENBERGH E, BILLIET L, WOESTIJNE K P and GYSELEN A : Relation between single-breath diffusing capacity and arterial blood gases in chronic obstructive lung disease. Scand J Resp Dis 49: 92-101, 1968. A 452
- VANROUX R and GREGOIRE M : La capacité de diffusion au CO chez le bronchiteux chronique. (The CO diffusion capacity in chronic bronchitis.) Acta Tuberc Belg 55: 488-97, 1964. A 453
- WAGNER P D, MAZZONE R W and WEST J B : Diffusing capacity and anatomic dead space for carbon monoxide ($C^{18}O$). J Appl Physiol 31: 847-52, 1971. A 454
- WAGNER W W Jr, LATHAM L P, BRINKMAN P D and FILLEY G F : Pulmonary gas transport time: larynx to alveolus. Science 163: 1210-1, 1969. A 455
- WEBER J, MORET P and CHAUVET M : L'utilité du test de diffusion au monoxyde de carbone dans l'exploration fonctionnelle du poulmon. (Utility of the diffusion test with carbon monoxide in functional exploration of the lung.) Helv Med Acta 34: Suppl: 101-2, 1967. A 456
- WEISKOPF R B and SEVERINGHAUS J W : Diffusing capacity of the lung for CO in man during acute acclimation to 14,246 ft. J Appl Physiol 32: 285-9, 1972. A 457
- WOLKONSKY P M : Pulmonary effects of air pollution. Arch Environ Health 19: 586-92, 1969. A 458
- WOOLF C R : An assessment of the fractional carbon monoxide uptake and its relationship to pulmonary diffusing capacity. Dis Chest 46: 181-9, 1964. A 459

1005051269

Additional Bibliography List No. 11

LESIONS OF THE CENTRAL NERVOUS SYSTEM IN CARBON MONOXIDE POISONING

- AITKEN R C B, DALY R J, KREITMAN N, MATTHEW H and PROUDFOOT A T: Coal gas and the brain. Brit Med J 1: 706-7, 1968. A 460
- AMYOT R, GIARD N and ROBERT F: Anoxie cérébrale aigue. (Acute cerebral anoxia.) Un Med Canad 96: 680-8, 1967. A 461
- ANDO S: (Cerebral lesions caused by carbon monoxide poisoning.) Iryo 20: 638-48, 1966. A 462
- ANON: Carbon monoxide poisoning. W Virginia Med J 60: 344-5, 1964. A 463
- ANON: Neurological complications of carbon monoxide poisoning. Lancet 1: 77, 1968. A 464
- ANON: Coal gas and the brain. Brit Med J 1: 398, 1968. A 465
- ARAI H: Clinical and pathological study of akinetic mutism: 12 autopsy cases. Brain Nerve Tokyo 21: 615-32, 1969. A 466
- ARNOTT G, PETIT H and CHABRIER A: Coma oxycarbone, survenue apres important intervalle libre, d'un syndrome akineto-hypertonique avec trismus et mutisme, evolution favorable. (Carbon monoxide coma. Occurrence, after an important free interval, of an akineto-hypertonic syndrome with trismus and mutism. Favorable evolution.) Lille Med 9: 728-33, 1964. A 467
- ASAI K and TORU M: Changes of the brain focal symptoms in two cases of carbon monoxide intoxication (interval form). Psychiat Neurol Jap 71: 776-89, 1969. A 468
- BADAL J: Lazenske lecení diskogenni nemoci krční páteře. (Balneological treatment of diskogenic disease of the cervical spine.) Cesk Otolaryng 13: 354-62, 1964. A 469
- BEARON A: Carbon monoxide intoxication. Minnesota Med 48: 1537-43, 1965. A 470
- BERTONE E: Complicazioni neuropsichiche dovute ad avvelenamento subacuto di monossido di carbonio. (Neuropsychic complications due to subacute poisoning with carbon monoxide.) Minerva Med 56: 1657, 1965. A 471
- BONNET M H, GRATADOU M, BONNET H and LECIAK J P: État confuso-déirant post-intervallaire après coma oxycarbone. (Post-interval confusional and delirious state after carbon monoxide coma.) J Med Lyon 48: 1367-9, 1967. A 472
- BOUR H, GUY-GRAND B, TUTIN M and TAMINIAUX A M: Glycorégulation et coma oxycarbonné. (Glycoregulation and carbon monoxide coma.) J Ann Diabet Hotel Dieu 7: 365-76, 1967. A 473
- BOUR H, TUTIN M and PASQUIER P: The central nervous system and carbon monoxide poisoning. I. Clinical data with reference to 20 fatal cases. Progr Brain Res 24: 1-30, 1967. A 474
- GRAMOND W A: Organic psychosis. Brit Med J 4: 561-4, 1968. A 475
- D'AMORE V, GIORDANO P L and PENATIG: A proposito di intossicazione acuta da ossido di carbonio a rapida evoluzione demenziale. Considerazioni su due casi. (Apropos of acute poisoning by carbon monoxide with rapid evolution toward dementia. Consideration on 2 cases.) G Psychiat Neuropat 96: 1-16, 1968. A 476
- DIMIZIO M, FELICI F and BIETTI C: Su un caso di avvelenamento da ossido di carbonio: contributo clinico. (On a case of carbon monoxide poisoning: clinical case.) Riv Neurol 39: 425-34, 1969. A 477
- DOBOSZ J and LUCZYWEK E: W sprawie stosunku zaburzeń wyższych czynności nerwowych uwarunkowanych ogniskowymi uszkodzeniami mózgu do ogólnego obniżenia sprawności intelektualnej. (Relationship of higher nervous activity disorders due to focal brain lesions to the general decrease in intellectual capacity.) Neurol Neurochir Pol 5: 497-502, 1971. A 478

1005051270

- DROGICHINA E A and RYZHKOVA M N : (The clinical picture and diagnosis of diencephalic pathology in occupational poisonings.) Gig Tr Prof Zabol 11: 20-4, 1967. A 479
- FAURE J, VINCENT D, ESCHAPASSE P, LOISEAU P and CASTAING R : Confrontation des signes électrocliniques observés au cours d'intoxications par oxyde de carbone. (Comparison of electro-clinical signs observed in carbon monoxide poisoning.) Rev Neurol (Paris) 112: 287-92, 1965. A 480
- GARLAND H and PEARCE J : Neurological complications of carbon monoxide poisoning. Q J Med 36: 445-55, 1967. A 481
- GARREL S, PERRET J, PELLAT J and ARNOULD P : Syndrome neuro-psychiatrique d'altération frontale: complication post-intervallaire d'une intoxication oxycarbonée. (Neuro-psychiatric syndrome of frontal aspect: delayed complications of carbon monoxide poisoning.) Rev Neurol (Paris) 122: 445-7, 1970. A 482
- GARREL S, PERRET J, PELLAT J and ARNOULD P : Neuro-psychiatric syndrome following carbon monoxide poisoning. Electroenceph Clin Neurophysiol 29: 534, 1970. A 483
- GAULTIER M, FOURNIER E, GERVAIS P and BODIN F : Encéphalopathie pancréatique survenue au décours d'une intoxication oxycarbonée. Comparaison avec l'encéphalopathie post-intervallaire de l'intoxication oxycarbonée. (Pancreatic encephalopathy occurring after carbon monoxide poisoning. Comparison with the post-interval encephalopathy of carbon monoxide poisoning.) Presse Med 72: 3263-5, 1964. A 484
- GIRARDI G, CIS C and PIATTI A : La sindrome nucleo-reticolare cronica nelle intossicazioni professionali. (Chronic nucleo-reticular syndrome in occupational poisonings.) Arch Ital Otol 78: 756-70, 1967. A 485
- GORALSKI H and JANUSZKO L : Zespoły neurologiczne i psychiatryczne po zatruciu tlenkiem węgla. (Neurological and psychiatric syndromes after carbon monoxide poisoning.) Neurol Neurochir Pol 2:633-7, 1968. A 486
- GORDON E B : Carbon monoxide encephalopathy. Brit Med J 5444: 1343, 1965. A 487
- GROHME S, SCHNEIDER H and MASSHOFF W : Encephalopathien bei Vita reducta. (Encephalopathies in vita reducta.) Internist (Berlin) 10: 430-42, 1969. A 488
- GUNTHER K D : Lange verkannte CO-Vergiftungen mit schweren neurologischen Symptomen. (Chronically misdiagnosed CO poisoning with severe neurological symptoms.) Psychiat Neurol Med Psychol (Leipz) 23: 368-77, 1971. A 489
- HAMEL-PUSKARIC H, BERITIC T, JUSIC A and FRANJIC F : Neurološke komplikacije otrovanja ugljičnim monoksidom. (Neurologic complications of carbon monoxide poisoning.) Neuropsihijatrija 18: 147-55, 1970. A 490
- HANSEN D : Berufshedingte Riechstörung infolge chronischer Kohlenoxydeinwirkung. (Occupationally induced anosmia due to chronic carbon monoxide effect.) HNO 5: 140-2, 1970. A 491
- HARADA M and KOZUMA Z : (A case of carbon monoxide poisoning with so-called Sudeck's syndrome, and various neurologic symptoms.) Brain Nerve (Tokyo) 20: 1095-9, 1968. A 492
- HIRAI T : (The relationship between the disturbance of consciousness and behavior disorders.) Adv Neurol Sci (Tokyo) 14: 712-22, 1971. A 493
- IKUTA T : (Somatosensory evoked responses in patients with carbon monoxide poisoning as compared with those in Schizophrenics.) Fol Psychiatr Neurol Jap 23: 285-9, 1969. A 494

1005051271

Additional Bibliography List No. 11

- INANAGA K : (Clinical problems of memory.) Adv Neurol Sci (Tokyo) 10: 648-60, 1966. A 497
- INANAGA K : Application of the averaged photopalpebral reflex in clinical neurology. Proc Aust Ass Neurol 5: 651-2, 1968. A 498
- ISHIKAWA H : (Effects of carbon monoxide on electrical activity of the brain: comparative studies on asphyxia, N₂-inhalation and CO-inhalation.) J Kumamoto Med Soc 43: 870-84, 1969. A 499
- JESCHECK J : Laryngologische Untersuchungsergebnisse und ihre Beziehungen zur Neurologie. Msschr Ohrenheilk 101:378-94, 1967. A 500
- JORDI A : Schädigungen des Nervensystems durch gewerbliche Gifte, unter besonderer Berücksichtigung der Frühsymptome. (Damage to the nervous system by industrial poisons with special consideration of early symptoms.) Praxis 56: 610-8, 1967. A 501
- KATSUKI S : (Neuropsychic symptoms of patients in carbon monoxide poisoning caused by mining explosions.) Jap J Clin Med 23: 1928-36, 1965. A 502
- KEHL H and KEHL R : Morbus Basedow nach Kohlenmonoxydgasvergiftung. (Basedow's disease following carbon monoxide poisoning.) Msschr Unfallheilk 70: 349-55, 1967. A 503
- KHROLENKO D E : (Nervous system involvement in acute carbon monoxide poisoning.) Klin Med (Moskva) 47: 130-1, 1969. A 504
- KOLB K P : Lokale ischämische Kontrakturen der Hand nach Suizidversuchen. (Local ischemic contractures of the hand following suicide attempts.) Munch Med Wochenschr 110: 1873-4, 1968. A 505
- KRUG H : Die Hirnkonsistenz bei tödlicher Kohlenmonoxydvergiftung. (Brain consistency and fatal carbon monoxide poisoning.) Deutsch Z Gerichtl Med 56: 74-80, 1965. A 506
- KUROIWA Y, SHIDA K and KATO M : (Neurological aspect of acute carbon monoxide poisoning.) Adv Neurol Sci (Tokyo) 13: 4-10, 1969. A 507
- LANGAUER-LEWOWICKA H : (Early and remote neurological disorders due to acute carbon monoxide poisoning.) Med Pracy 17: 340-3, 1966. A 508
- LAPRESLE J and FARDEAU M : Les leuco-encéphalopathies de l'intoxication oxycarbonée. (The leukoencephalopathies caused by carbon monoxide poisoning. Study of sixteen anatomical-clinical observations.) Acta Neuropath (Berlin) 6: 327-48, 1966. A 509
- LAPRESLE J and FARDEAU M : The central nervous system and carbon monoxide poisoning. II. Anatomical study of brain lesions following intoxication with carbon monoxide (22 cases). Progr Brain Res 24: 31-74, 1967. A 510
- LAPRESLE J and FARDEAU M : Intoxication aigue par l'oxyde de carbone. Étude anatomique d'une encéphalopathie remarquable par la diffusion des lésions nécrotiques et l'importance des dépôts calciques. (Acute carbon monoxide poisoning. Anatomic study of an unusual encephalopathy caused by the diffusion of necrotic lesions and the importance of calcium deposits.) Bol Estud Med Biol 27: 9-17, 1971. A 511
- MACKINTOSH T F : Akinetic mutism following coal-gas poisoning with subsequent recovery. Postgrad Med J 41: 567-73, 1965. A 512
- MATTHEW H and PROUDFOOT A T : Coal gas and the brain. Brit Med J 1: 638, 1965. A 513
- MOORE M E and FINESTONE A J : The case of the disappearing headache. New Eng J Med 276: 1216, 1968. A 514
- MOROVIC-BUDAK A : Die Bedeutung des Befundes von punktförmigen Blutungen im Gebiet des Tegmen tympani. (Significance of punctiform hemorrhages in the area of the Tegmen

1005051272

Additional Bibliography List No. 11

- MUROFUSHI K and MINAGAWA M: (An autopsy case of carbon monoxide poisoning with senile findings.) Adv Neurol Sci (Tokyo) 13:39-48, 1969. A 516
- OKUMA T, ISHINO H, SUNAMI Y and MOTOIKE M: An autopsy case of relapsing form carbon monoxide intoxication with special reference to the apallic syndrome and sleep cycle pattern. Fol Psychiat Neurol Jap 22: 43-51, 1968. A 517
- OSTROWSKA D: Morfologia odczynów tkankowych w encefalopatii tlenkoweglowej. (Morphology of tissue reactions in carbon monoxide encephalopathy.) Neurol Neurochir Pol 1: 561-8, 1967. A 518
- OSWALD E: Organische Demenz bei Intoxikationen. (Organic dementia in intoxications.) Wien Med Wochenschr 116-964-6, 1966. A 519
- PALADE D, MIHAI E, GOILAV N and SOVAREL G: Tulburarile neuropsihice la bolnavii cu oxicarbonism acut internati in sectia de boli interne a spitalului Piatra neamt intre anii 1964 si 1966. (Neuropsychological disorders in patients with acute carbon monoxide poisoning hospitalized in the department of internal medicine in the Piatra Neamt Hospital in the years 1964-1966.) Rev Medicochir Iasi 73: 1005-9, 1969. A 520
- PAULEIKHOFF B, MÜLLER-FAHLBUSCH MESTER H and MEIßNER U: Über spätfolgen, insbesondere Merkschwäche, nach Vergiftung mit Kohlenmonoxyd. (Late sequelae, especially weakness of memory, following carbon monoxide poisoning.) Fortschr Neurol Psychiatr 39: 349-77, 1971. A 521
- PEARCE J: Coal gas and the brain. Brit Med J 1: 767, 1968. A 522
- RINGEL S P and KLAUANS H L Jr: Carbon monoxide-induced Parkinsonism. J Neurol Sci 16: 245-51, 1972. A 523
- ROSENBLUTH P: Differential diagnosis of coma. Industr Med Surg 37: 108-12, 1968. A 524
- SANDERS H I and WARRINGTON E K: Memory for remote events in amnesic patients. Brain 94: 661-8, 1971. A 525
- SCHOTT B, TOMMASI M, BOURRAT C and MICHEL D: Neuropathie périphérique démyélinisante au cours d'une intoxication par l'oxyde de carbone. (Demyelinating peripheral neuropathy in the course of poisoning by carbon monoxide.) Rev Neurol (Paris) 116: 429-37, 1967. A 526
- SESSA T and SANNA G: La velocità di conduzione nervosa nelle malattie professionali. (Nerve conduction rate in occupational diseases.) Fol Med (Napoli) 49: 809-15, 1966. A 527
- SHIDA K and KUROIWA Y: (Psychiatric signs, aphasia, apraxia and agnosia in acute carbon monoxide poisoning, with special reference to experiences in coal mine explosions.) Jap J Clin Med 27: 2333-7, 1969. A 528
- SHIMOJIMA W: (Classification of cerebral herniation.) Brain Ner (Tokyo) 22:577-86, 1970. A 529
- SHIRAKI H: (The neuropathology of carbon monoxide poisoning in humans - with special reference to the changes of globus pallidus.) Adv Neurol Sci (Tokyo) 13: 25-33, 1969. A 530
- SHIRUKI H and TATETSU M: (Toxic mental disorders.) Psychiat Neurol Jap 69: 994-1029, 1967. A 531
- SMITH J S, BRIERLEY H and BRANDON S: Akinetic mutism with recovery after repeated carbon monoxide poisoning. Psychol Med 1: 172-7, 1971. A 532
- SNYDER R D: Carbon monoxide intoxication with peripheral neuropathy. Neurology 20: 177-80, 1970. A 533
- TAKAMATSU I, TAKEICHI M and YUKITAKE A: (Light and electron microscopic observation on brains of experimentally induced CO poisoning cats.) Adv Neurol Sci (Tokyo) 13: 59-65, 1969.

1005051273

Additional Bibliography List No. 11

- TOMASINI M : Un caso di encefalopatia demenziale postumo di intossicazione acuta da ossido di carbonio. (A case of demential encephalopathy after acute carbon monoxide poisoning.) Med Lav 58: 632-5, 1967. A 535
- TRILLET M, GIRARD P F and BOULETREAU P : Myelopathie oxycarbonée? (Carbon monoxide myelopathy?) Presse Med 78: 1843, 1970. A 536
- TRONZANO L and COSCIA G : Paralisi del radiale in un caso di intossicazione acuta da ossido di carbonio. (Paralysis of the radial nerve in a case of acute carbon monoxide poisoning.) Rass Med Industr 33: 401-3, 1964. A 537
- VITAL C and PICARD J : Neuropathologie de quelques intoxications aiguës. (Neuropathology of some acute poisonings.) J Med Bordeaux 144: 1029-38, 1967. A 538
- VUIA O : Leucoencéphalopathie souscorticale par intoxication au CO. (Subcortical leukoencephalopathy caused by CO poisoning.) Acta Neuropath(Berlin) 7: 305-14, 1967. A 539
- WENDER M : Studies of cerebral lipids in a relapsing case of carbon monoxide poisoning. Acta Neuropath(Berlin) 2: 371-7, 1963. A 540
- WITUSIK W : Erworbene chromatosthenopie und Chromatoanopie bei Kraftfahrern. (Acquired chromatosthenopia and chromatoanopia in automobile drivers.) Klin Monatsbl Augenheilkd 159: 689-92, 1971. A 541
- YASUKOCHI G and YASUOKA F : (Changes of personality as a sequela of acute carbon monoxide poisoning.) Psychiat Neurol Jap 69: 249-56, 1967. A 542
- YUKITAKE A : (Clinical investigation on acute carbon monoxide poisoning due to explosion in Miike coal mine 5 yrs. after the accident.) Psychiat Neurol Jap 72: 411-8, 1970. A 543

1005051274

CARBON MONOXIDE ON HEPATIC CELLS

- ALVARES A P, SCHILLING G, LEVIN W and KUNTZMAN R: Studies on the induction of CO-binding pigments in liver microsomes by phenobarbital and 3-methyl cholanthrene. Biochem Biophys Res 29: 521-6, 1967. A 544 Reprint
- ALVARES A P, SCHILLING G, LEVIN W and KUNTZMAN R: Inability of substrates to alter the carbon monoxide and ethyl isocyanide difference spectra of microsomal hemoprotein. J Pharmacol Exp Ther 176: 1-10, 1971. A 545
- BELYAEV V A: (Concerning carbon monoxide action upon the glycogen-forming function of the liver.) Farmakol Toksik 30: 234-6, 1967. A 546
- BHATNAGAR S P: Release of cholinesterase from rat liver by nicotinamide and carbon tetrachloride. Biochem Pharmacol 19: 2009-16, 1970. A 547
- BOGDAN D P and JUCHAU M R: Characteristics of induced benzpyrene hydroxylase activity in the rat foeto-placental unit. Europ J Pharmacol 10: 119-26, 1970. A 548
- BRAUSER B, VERSMOLD H and BÜCHER T: Mechanisms of mixed function oxygenation. Redox kinetics and redox state of P-450 in whole liver. Hoppe-Seyler's Z Physiol Chem 349: 1589-90, 1968. A 549
- CHANCE B, ERECINSKA M and WAGNER M: Mitochondrial responses to carbon monoxide toxicity. Ann NY Acad Sci 174: 193-204, 1970. A 550
- CONNERY A H, LEVIN W, IKEDA M and KUNTZMAN R: Inhibitory effect of carbon monoxide on the hydroxylation of testosterone by rat liver microsomes. J Biol Chem 243: 3912-15, 1968. A 551
- COOPER D Y, SCHLEYER H and ROSENTHAL O: Some chemical properties of cytochrome P-450 and its carbon monoxide compound (P-450.CO). Ann NY Acad Sci 174: 205-17, 1970. A 552
- DATSENKO I I, DOTSENKO N S, MARTYNIUK V Z and PALCHEVSKY E I: (Characteristics of pathomorphological changes in the organism in carbon monoxide intoxication.) Vrach Delo 6: 77-80, 1965. A 553
- DATSENKO I I, DOTSENKO N S, MARTYNIUK V Z and PALCHEVSKY E K: (Histochemistry of polysaccharides and nucleoproteins in carbon monoxide poisoning.) Vrach Delo 1: 38-9, 1967. A 554
- ESTABROOK R W, FRANKLIN M R and HILDEBRANDT A G: Factors influencing the inhibitory effect of carbon monoxide on cytochrome P-450-catalyzed mixed function oxidation reactions. Ann NY Acad Sci 174: 218-32, 1970. A 555
- HERNANDEZ P H, MAZEL P and GILLETTE J R: Studies on the mechanism of action of mammalian hepatic azoreductase. II. The effects of phenobarbital and 3-methylcholanthrene on carbon monoxide sensitive and insensitive azoreductase activities. Biochem Pharmacol 16: 1877-88, 1967. A 556
- HLAVICA P, KIESE M, LANGE G and MOR G: Die Wirkung von Kohlenmonoxid auf die N-Hydroxylierung von Anilin durch Kaninchenlebermikrosomen. (Effect of carbon monoxide on the N-hydroxylation of aniline by rabbit liver microsomes.) Naunyn-Schmied Arch Pharm 263: 269-70, 1969. A 557
- HOCHSTRATE C and OBERDISSE E: Biochemische Veränderung im Serum der Ratte nach kombinierter Applikation lebervergrößernder und lebertoxischer Pharmaka. (Biochemical change in rat serum following combined application of inducing and hepatotoxic drugs. Naunyn-Schmied Arch Pharmacol 266: 357-8, 1970. A 558
- ICHIKAWA Y, HAGIHARA B and YAMANO T: Magnetic and spectrophotometric properties of the microsomal carbon monoxide binding pigment. Arch Biochem Biophys 120: 204-13, 1967. A 559

1005051275

- JEDRYCHOWSKI W, KUŚ J, PIOTROWSKI J and SAWICKI B : Zachowanie się aktywności oksydazy cytochromowej i peroksydazy w wątrobie szczura w doświadczalnym ostrym zatruciu tlenkiem węgla. (Cytochrome oxidase and peroxidase activities in the livers of rats in experimental carbon monoxide poisoning.) FoL Med Cracov 7: 429-35, 1965. A 560
- JEDRYCHOWSKI W, KUŚ J, PIOTROWSKI J and SAWICKI B : Zawartość glikogenu w wątrobie przy zatruciu tlenkiem węgla. (Glycogen content of the livers of rats poisoned with carbon monoxide.) FoL Med Cracov 7: 437-42, 1965. A 561
- KAMATAKI T and KITAGAWA H : (Studies of the binding of carbon monoxide with liver microsomal P-450 reduced by NADPH). J Pharm Soc Jap 91: 422-3, 1971. A 562
- KAMPFFMEYER H and KIESE M : The effect of carbon monoxide on the hydroxylation of aniline and N-Ethylaniline by microsomal enzymes. Naunyn Schmied Arch. Pharmacol 250: 1-8, 1965. A 563
- KRATZ F : Zur Frage der Entgiftung von Fremdstoffen durch die Leber. (On the problem of foreign substances detoxification through the liver.) Dtsch Med Wochensh 93: 2495-8, 1968. A 564
- KROBER F, LANGE G, MATHES S and MOR G : Änderung der Affinität isolierter Leber-mikrosomen für Anilin, N-Äthylanilin, Sauerstoff, Äthylisocyanid und Kohlenmonoxid durch die Behandlung junger Kaninchen mit Phenobarbital. (Change in the affinity of isolated liver microsomes for aniline, N-ethylaniline, oxygen, ethyl isocyanide and carbon monoxide by the treatment of young rabbits with phenobarbital.) Naunyn Schmied Arch Pharmacol 260: 161-3, 1968. A 565
- KROBER F, LANGE G, MATHES S and MOR G : Änderungen der spektralen Dissoziationskonstanten (Ks) von Anilin und N-Äthylanilin, der scheinbaren Michaelis-Konstanten (Km) für die Hydroxylierung dieser Substrate und der Affinität der beteiligten Enzyme für Sauerstoff und Kohlenmonoxid. (Qualitative changes in liver microsomes of phenobarbital-treated rabbits. Changes in spectral dissociation constants (Ks) of aniline and N-ethylaniline, in the apparent Michaelis constants (Km) for hydroxylation of these substrates, and in affinity of the enzymes involved for oxygen and carbon monoxide.) Naunyn Schmied Arch Pharmacol 267: 307-26, 1970. A 566
- KUNTZMAN R, LEVIN W, JACOBSON M and CONNEY A H : Studies on microsomal hydroxylation and the demonstration of a new carbon monoxide binding pigment in liver microsomes. Life Sci 7: 215-24, 1968. A 567
- LANGE P, KÄSTNER D and JUNG F : Die Beeinflussung der CCl_4 -Hepatotoxizität und die Hemmung des mikrosomalen Stoffwechsels durch Diäthylthiokarbamat. (Influence of diethylthiocarbamate on the CCl_4 -liver toxicity and the inhibition of the microsomal metabolism.) Acta Biol Med Ger 24: 29-33, 1970. A 568
- LATALSKI M and PAWLOWSKA A : Badania nad ultrastrukturą komórek wątrobowych po zatruciu gazem świetlnym. (Ultrastructure of the liver cells in lighting gas poisoning.) Patol Pol 20391-6, 1969. A 569
- LATALSKI M and PAWLOWSKA A : Fine structure of liver cell after lighting gas poisoning. Pol Med J 19: 891-5, 1970. A 570
- LEVIN W and KUNTZMAN R : Biphasic decrease of radioactive hemoprotein from liver microsomal CO-binding particles. J Biol Chem 244: 3671-6, 1969. A 571
- LEVIN W and KUNTZMAN R : Biphasic decrease of radioactive hemoprotein from liver microsomal carbon monoxide-binding particles. Effect of phenobarbital and chlordan. Mol Pharmacol 5: 499-506, 1969. A 572
- MAZALESKI S C, COLEMAN R L, DUNCAN R C and NAU C A : Subcellular trace metal alterations in rats exposed to 50 PPM of carbon monoxide. Am Industr Hyg Ass J 31: 183-8, 1970. A 573

1005051276

- MONTGOMERY M R and RUBIN R J : The effect of carbon monoxide inhalation on in vivo drug metabolism in the rat. J Pharmacol Exp Ther 179: 465-73, 1971. A 574
- NIZHEGORODOV V M and MARCHOZKY J D : (The effect of small concentrations of carbon monoxide and nitrogen oxides on the status of the supply and need of the animal organism for vitamin B-6) Gig Sanit 34: 96-7, 1969. A 575
- OMURA T and SATO R: The carbon monoxide-binding pigment of liver microsomes. I. Evidence for its hemoprotein nature. J Biol Chem 239: 2370-8, 1964. A 576
- RIKANS L E and VAN DYKE R A : Evidence for a different CO-binding pigment in solubilized rat hepatic microsomes. Biochem Pharmacol 20: 15-22, 1971. A 577
- RONDIA M D : Abaissement de l'activité de la benzopyrène-hydroxylase hépatique in vivo après inhalation d'oxyde de carbone. (Lowering of the activity of hepatic benzopyrene-hydroxylase in vivo after carbon monoxide inhalation.) C R Acad Sci Paris 271: 617-9, 1970. A 578
- WARBURG O, GEISLERAWand LORENZ S : Bemerkung über die Tryptophan-Oxygenase. (Note on tryptophan oxygenase.) Hoppe-Seyler Z Physiol Chem 348: 899-901, 1967. A 579
- WILSON L D, NELSON D H and HARDING B W : A mitochondrial electron carrier involved in steroid hydroxylations. Biochim Biophys Acta 99: 391-3, 1965. A 580
- WOHLRAB H and OGUNMOLA B G : Carbon monoxide binding studies of cytochrome a_3 hemes in intact rat liver mitochondria. Biochemistry 10: 1103-6, 1971. A 581

1005051277

Additional Bibliography List No. 13

CARBON MONOXIDE ON UNICELLULAR ORGANISMS AND LOWER VERTEBRATES

- BAKER, F D and TUMASONIS C F: Modified roller drum apparatus for analyzing effects of pollutant gases on tissue culture systems. Atmos Environ 5: 891-3, 1971. A 582 Reprint
- BAKER F D and TUMASONIS C F: Carbon monoxide and avian embryogenesis. Arch Environ Health 24: 53-61, 1972. A 583
- BARBOSA P and PETERS T M: The effects of vital dyes on living organisms with special reference to Methylene Blue and Neutral Red. Histochemical J 3: 71-93, 1971. A 584
- BOULEY G, GODIN J, ROUSSEL A and GIRARD F: Mise en évidence d'une production importante de monoxyde de carbone par des milieux de culture bacteriologiques stériles. (Demonstration of an important production of carbon monoxide by sterile bacteriologic culture media.) C R Acad Sci(Paris) 272: 1459-61, 1971. A 585
- BROBERG P L and SMITH L: The cytochrome system of bacillus megaterium KM. The presence and some properties of two CO-binding cytochromes. Biochim Biophys Acta 131: 479-89, 1967. A 586
- CAIRNS J and DENHARDT D T: Effect of cyanide and carbon monoxide on the replication of bacterial DNA in vivo. J Mol Biol 36: 335-42, 1968. A 587
- DATSENKO I I: (Effect of aero-ionization on the animal organism in carbon monoxide poisoning.) Gig Sanit 29: 100-1, 1964. A 588
- FLEIG C: Influence de la fumée de tabac et de la nicotine sur le développement de l'organisme. (Influence of nicotine of tobacco smoke in the development of the organism.) C R Soc Biol Paris 64: 683-5, 1908. A 589
- FRANCISCO D E and SILVEY J K G: The effect of carbon monoxide inhibition on the growth of an aquatic streptomycete. Canad J Microbiol 17: 347-51, 1971. A 590
- BINNENBRUCK H, HAUSEN A, RUNOW P and WERHEIT H: Über probenpreparation, Oberflächenzustand und Kristallbaufehler von einkristallinem β -rhomboedrischem Bor. (On sample preparation, surface conditions and lattice defects of monocrystalline β -rhombohedral boron.) Z Naturforsch 25: 1431-4, 1970. A 591
- FRONING G W, MATHER F B, DADDARIO J and HARTUNG T E: Effect of automobile exhaust fume inhalation by poultry immediately prior to slaughter on color of meat. Poult Sci 48: 485-7, 1969. A 592
- HAHN W E and COPELAND D E: Carbon monoxide concentrations and the effect of aminopterin on its production in the gas bladder of physalia physalis. Comp Biochem Physiol 18: 201-7, 1966. A 593
- HIRSCH P: Photosynthetic bacterium growing under carbon monoxide. Nature 217: 555-6, 1968. A 594
- HOLETON G F: Oxygen uptake and transport by the rainbow trout during exposure to carbon monoxide. J Exp Biol 54: 239-54, 1971. A 595
- HOLETON G F: Respiratory and circulatory responses of rainbow trout larvae to carbon monoxide and to hypoxia. J Exp Biol 55: 683-94, 1971. A 596
- JENEY E and MEDVE F: The effect of CO, KCN and NaN_3 on the nucleic acid content of Ehrlich ascites tumor cells. Biochem Pharmacol 16: 1899-1902, 1967. A 597
- LEE L P and SCHRAUZER G N: The reaction of vitamin B_{12a} and of cobaloximes with carbon monoxide. Evidence for self-reduction of vitamin B_{12a} in neutral solution. J Am Chem Soc 90: 5274-6, 1968. A 598
- LEWIS S E: Effect of carbon monoxide on metabolism of insecticides in vivo. Nature 215: 1408-9, 1967. A 599

1005051278

- LOCKSHIN A and BURRIS R H : Inhibitors of nitrogen fixation in extracts from clostridium pasteurianum. Biochim Biophys Acta 111: 1-10, 1965. A 600
- MAENO H and FEIGELSON P : Studies on the interaction of carbon monoxide with tryptophan oxygenase of pseudomonas. J Biol Chem 243: 301-5, 1968. A 601
- McGRATH J J and JAEGER J : Effect of iodoacetate on the carbon monoxide tolerance of the chick. Resp Physiol 12: 71-6, 1971. A 602
- McGRATH J J and MOFFA J V : System to evaluate the influence of chronic exposure to CO on the hatching eggs of the white leghorn chicken. J Air Pollut Contr Ass 22: 123, 1972. A 603
- MOX T C K, RICKARD P A D and MOSS F J : The carbon monoxide-reactive haemoproteins of yeast. Biochim Biophys Acta 172: 438-49, 1969. A 604
- PUREC L and KRASNA A I : The activation of the hydrogenase of proteus vulgaris by visible light. Biochemistry 57: 1416-21, 1967. A 605
- RAY J W : The epoxidation of aldrin by housefly microsomes and its inhibition by carbon monoxide. Biochem Pharmacol 16: 99-107, 1967. A 606
- REVSIN B and BRODIE A F : Carbon monoxide-binding pigments of mycobacterium phlei and escherichia coli. J Biol Chem 244: 3101-4, 1969. A 607
- SANZHIEVA E U : (Myxobacteria in the cultures of hydrogen and CO-oxidizing organisms.) Mikrobiologia 39: 817-20, 1970. A 608
- SANZHIEVA E U and ZAVARZIN G A : (Bacteria oxidizing carbon monoxide.) Dokl Acad Nauk SSSR 196: 956-8, 1971. A 609
- SCHLECHT H : Ein Beitrag zur Kohlenmonoxydvergiftung beim Schwein. (Carbon monoxide poisoning in swine.) Wien Theraerztl Monatsschr 58: 263-4, 1971. A 610
- SCHRAUZER G N and LEE L P : The reduction of vitamin B_{12a} by carbon monoxide. Arch Biochem Biophys 138: 16-25, 1970. A 611
- TABER H W and MORRISON M : Electron transport in staphylococci. Properties of a particle preparation from exponential phase staphylococcus aureus. Arch Biochem Biophys 105: 367-79, 1964. A 612
- TIMMONS R B : The photochemically induced reactions of sulfur dioxide with alkanes and carbon monoxide. Photochem Photobiol 12: 219-30, 1970. A 613
- TRUDINGER P A : Carbon monoxide-reacting pigment from Desulfotomaculum nigrificans and its possible relevance to sulfite reduction. J Bacteriol 104: 158-70, 1970. A 614
- VENNESLAND B and JETSCHMANN C : The nitrate dependence of the inhibition of photosynthesis by carbon monoxide in chlorella. Arch Biochem Biophys 144: 428-37, 1971. A 615
- WAYLAND B B and MOHAJER D : Cobalt (II). Tetraphenylporphyrin complex with carbon monoxide. J Am Chem Soc 93: 5295-6, 1971. A 616

1005051279

Additional Bibliography List No. 14

ACCIDENTAL POISONING INVOLVING CARBON MONOXIDE AND OTHER CAUSATIVE FACTOR

- AITKEN R C B, BUGLASS D and KREITMAN N : The changing pattern of attempted suicide in Edinburgh, 1962 - 67. Brit J Prev Soc Med 23: 111 - 115, 1969. Reprint A 617
- AMENDT P and REDDEMANN H : Akzidentelle vergiftungen im kindesalter. (Accidental poisoning in childhood). Z Gesamte Inn Med 26: 188 - 90, 1970. A 618
- ANON : Burnt children. Brit Med J 1: 790, 1969. A 619
- BEAN, W B : President's address. The ecology of the soldier in World War II. Trans Am Clin Climatol Assoc 79: 1 - 12, 1968. A 620
- BRANDENBERGER H : Résolution de quelques problèmes de chimie toxicologique et légale par absorption atomique. (Solution of several problems of toxicologic and legal chemistry by atomic absorption). Ann Biol Clin (Paris) 25: 1053-62, 1967. A 621
- BURSTON G R : Self-poisoning in elderly patients. Geront Clin (Basel) 11: 279-89, 1969. A 622
- BURVILL P W : Methods of suicide in Western Australia. Med J Aust 2: 411-4, 1970. A 623
- DAVID A : Sebevražedné otravy toxickými průmyslovými látkami. (Suicidal poisonings using industrial poisons). Cas Lek Cesk 110: 118-22, 1971. A 624
- FARBEROW N L and SIMON M D : Suicides in Los Angeles and Vienna. An intercultural study of two cities. Public Health Rep 84: 389-403, 1969. A 625
- FATINI G and GALLENGA G : Considerazioni statistiche su 900 casi di morte improvvisa. (Statistical considerations on 900 cases of sudden death) Osped Ital Chir 18: 41-9, 1968. A 626
- FRANCOIS R C and BERTIN M : Etude statistique de la fréquence des certaines manifestations cliniques au cours de l'intoxication aiguë par l'oxyde de carbone. Leur valeur pronostique immédiate. (Statistical study of the frequency of certain clinical manifestations during acute carbon monoxide poisoning. Their immediate prognostic value). Rass Med Industr 33: 380-91, 1964. A 627
- GAULTIER M, FREJAVILLE J P, BISMUTH C and PEBAY-PEYROULA F : Analyse des dossiers d'hypoxies survenues lors d'intoxications aiguës à l'hôpital Fernand-Widal. (Analysis of histories of cases of hypoxia during acute poisoning seen at the Hospital Fernand-Widal). Poumon Coeur 26: 931-6, 1970. A 628
- GOULDING R : The role of poisons information centres. Practitioner 194: 120-5, 1965. A 629
- GRAHAM J D P and HITCHENS R A N : Trends in hospitalized accidental poisoning. Brit J Prev Soc Med 22: 55-58, 1968. A 630
- GREGORY K L, MALINOSKI V F and SHARP C R : Cleveland clinic fire survivorship study, 1929-1965. Arch Environ Health 18: 508-15, 1969. A 631
- KAYE S : Bedside toxicology. Pediatr Clin North Am 17: 515-24, 1970. A 632
- KIM M W and PARK C S : Carbon monoxide poisoning in Korea. Proc Aust Ass Neurol 5: 385-90, 1968. A 633
- LACHNIT V : Vergiftungen in der krankenhauspraxis. (Poisoning in hospital practice). Wien Z Inn Med 45: 242-6, 1964. A 634

1005051280

- LITMAN R E : Psychological-psychiatric aspects in certifying modes of death. J Forensic Sci 13: 46-54, 1968. A 635
- MALIK M O A : Problems in the diagnosis of the causes of death in burned bodies. J Forensic Sci Soc 11: 21-8, 1971. A 636
- MATTHEW H : Acute poisoning: some myths and misconceptions. Br Med J 1: 519-22, 1971. A 637
- PRELLWITZ W, SCHUSTER H P, SCHYLLA G, BAUM P, SCHÖNBORN H, UNGERN-STERNBURG A, BRODERSEN H C and POEPLAU W : Zur differential diagnose von organbeteiligungen bei exogenen intoxicationen mit hilfe klinischer und klinisch-chemischer untersuchungen. (Differential diagnosis of organ involvement in exogenous poisoning by means of clinical and clinico-chemical studies). Klin Wochenschr 48: 51-3, 1970. A 638
- REDDEMANN H, AMENDT P and JÄHRIG K : Spätprognose akzidenteller vergiftungen im kindesalter. (Late prognosis of accidental poisoning in childhood). Dtsch Gesundheitsw 25: 2027-32, 1970. A 639
- ROPSCHITZ D H and OVENSTONE I M K : Two years' survey on self-aggressive acts, suicides and suicidal threats in the Halifax district between 1962 and 1964. Part I. Self-aggressive acts in the Halifax area. Int J Soc Psychiat 14: 165-87, 1968. A 640
- STURNER W Q : Some perspectives in "cot death". J Forensic Med 18: 96-107, 1971. A 641
- SZUCHOWSZKY G, KENYERES I and HARSÁNYI L : Analyse von 2956 vergiftungs-selbstmordfällen. (Analysis of 2956 cases of suicidal poisoning). Deutsch Z Ges Gerichtl Med 66: 19-29, 1969. A 642
- VARESE L A and SORANZO L : Avvelenamenti acuti nell'infanzia. Avvelenamenti da ossido di carbonio. (Acute poisoning in children. VII. Carbon monoxide poisoning). Minerva Pediat 20: 871-83, 1968. A 643
- VIEWEG C, GRÜNEWALD G and ZIEGLER C : Die akute vergiftung. (Acute intoxication). Dtsch Gesundheitsw 25: 2480-5, 1970. A 644
- VOGEL, C : Vergiftungen im kindesalter. Eine klinische zehnjahresübersicht. (Poisonings in childhood. A 10-year clinical study). Z Aerztl Fortbild (Jena) 62: 486-91, 1968. A 645

1005051281

Additional Bibliography List No. 15

ACCIDENTAL POISONING INVOLVING CARBON MONOXIDE

- en dehors
- ALEXANDRE A : La pollution de l'atmosphère par l'oxyde de carbone/les lieux de travail. Dépistage. Manifestations cliniques. (Atmospheric pollution due to carbon monoxide outside places of employment. Detection. Clinical manifestations). Acta Tuberc Belg 58: 905-9, 1967. A 646
- ANDERSON T B : Natural gas, unnatural causes. Lancet 1: 466, 1970. A 647
- ANON : Natural gas: friend or foe? Lancet 2: 699-700, 1970. A 648
- ANON : Carbon monoxide poisoning. Brit Med J 1: 180, 1970. A 649
- ARONDEL E, GAUBERTI P and ROCHET J : Six cas d'anoxie accidentelle par appareils de chauffage mobiles a gaz butane. (Six cases of accidental anoxia caused by a mobile butane gas heating appliance). Ann Med Leg (Paris) 44: 443-5, 1964. A 650
- BERTIN M, FRANCOIS R C, PÉQUIGNOT H and SOULAIRAC A : Épidémiologie des asphyxies par le gaz. Remarques méthodologiques. (Epidemiology of asphyxia due to gas. Methodological remarks). Sem Hop Paris 46: 2657-71, 1970. A 651
- BETHEUIL M J and DELAHAYE-POLOUVIER G : A propos de deux comas oxycarbonés. (Apropos of 2 carbon monoxide comas). Anesth Analg (Paris) 24: 439-41, 1967. A 652
- BOZEK J, PAJOR Z and WASOWICZ Z : Przypadek ciężkiego zatrucia tlenkiem węgla dziecka 6-letniego. (Case of severe carbon monoxide poisoning in a 6-year old child). Pediat Pol 40: 1271-3, 1965. A 653
- BOUR H : L'intoxication oxycarbonée. (Carbon monoxide poisoning). Gaz Med France 71: 2793-814, 1964. A 654
- BURG F D and DOUGLASS J M : In cold gas. Safeguards against carbon monoxide poisoning. Clin Pediat (Phila) 8: 590-3, 1969. A 655
- CALLIGARI G : Intossicazione da ossido di carbonio, cianuri e sostanze metaemoglobinizzanti. (Carbon monoxide, cyanide and methemoglobinizing substance poisoning). Minerva Anest 34: 1109-16, 1968. A 656
- CHERKAVSKIR N B : (Carbon monoxide poisoning). Voen Med Zh (Russia) 11: 34-5, 1970. A 657
- CROSETTI L, PETTINATI L and RUBINO G F : Alcune considerazioni in tema di prevenzione tecnica e biologica dell'intossicazione da ossido di carbonio. (Considerations on the technical and biological prevention of carbon monoxide poisoning). Med Lavoro 56: 604-12, 1965. A 658
- CUCHE M M and BERNARD C : A propos de quelques formes particulières d'intoxication oxycarbonée aiguë. (Apropos of various special forms of acute carbon monoxide poisoning). Rev Lyon Med 18: 217-22, 1969. A 659
- DALGAARD J B : 550 Kohlenoxyd-todesfälle. (550 deaths from carbon monoxide poisoning). Acta Med Leg Soc (Liege) 18: 25-37, 1965. A 660
- DIMIZIO M, FELICI F and BIETTI C : Su un caso di avvelenamento da ossido di carbonio: contributo clinico. (On a case of carbon monoxide poisoning: clinical case). Riv Neurol 39: 425-34, 1969. A 661
- DOUZE J M : Koolmonoxydevergiftiging door aardgas. Douchen, een gevaar? (Carbon monoxide poisoning from natural gas. Showering, a danger?). Ned Tijdschr Geneesk 115: 1487-93, 1971. A 662

1005051282

- DOUZE J M C, HEYST A N P, KREUKNIET J, LEEUW R J M and HAMELINK M L : Koolmonoxi-devergiftigen. Is gebruik van aardgas wel zo ongevaarlijk? Pharm Weekblad 102: 351-60, 1967. A 663
- FELDMAN I G and LAMPERT F F : (Air pollution by highway photoxidants on various floors of apartment houses). Gin Sanit (Russia) 33: 89-91, 1968. A 664
- FISHER T L : Carbon monoxide poisoning: Legal responsibility for failure to diagnose. Canad Med Ass J 99: 235-6, 1968. A 665
- FRYZE C, GRUSZKA E and ZAWADZKI W : Zatrucie gazem swietlnym (tlenkiem wegla) o bardzo ciezkim przebiegu. (Case of very severe carbon monoxide poisoning). Przegł Lek (Pol) 26: 723-4, 1970. A 666
- GILL G S : The Jiko and carbon-monoxide poisoning. East Afr Med J 48: 85-7, 1971. A 667
- GLASS F, MALLACH H J and WOJAHN H : Über den CO-Gehalt des blutes bei akuter Kohlenmonoxyd-Vergiftung. (On the CO-content of the blood in acute carbon monoxide poisoning). Arzneimittelforschung (Germany) 16: 1553-5, 1966. A 668
- GOLACKA K, JANIK-KURYLICIO S and ROZEK S : Zatrucia tlenkiem wegla. (Carbon monoxide poisoning). Pol Tyg Lek 24: 1813-5, 1969. A 669
- GOLDSMITH J R : Carbon monoxide. Science 157: 842-4, 1967. A 670
- GRÉMY F, SALMON D, FRANCOIS R C and BERTIN M : Asphyxies accidentelles et volontaires par le gaz d'éclairage survenues a Paris de 1949 a 1962. (Accidental and voluntary asphyxiations by coal gas occurring in Paris from 1946 to 1962. Statistical study. Particular influence of the concentration of carbon monoxide and atmospheric conditions). Presse Med (France) 76: 1099-102, 1968. A 671
- GRIFFITHS J C : North Sea gas. Lancet 1: 562, 1970. A 672
- GUEYE S N, BA H and DIOP I : L'intoxication oxycarbonée à Dakar. (Carbon monoxide poisoning in Dakar). Bull Soc Med Afr Noire Lang Fr 10: 422-5, 1965. A 673
- HUGHES E R and FISHER D A : Carbon monoxide poisoning. J Arkansas Med Soc 62: 255-60, 1965. A 674
- KASHIMA T, FUKUI M, MASUDA Y, WAKASUGI C and HAYAMA R : Report of five cases where ordinary vinyl bag was used for suicidal purpose. Suffocation, CO-poisoning and "thinner"-poisoning. Jap J Leg Med 23: 248-52, 1969. A 675
- KITTREDGE R D : Pulmonary edema in acute carbon monoxide poisoning. Am J Roentgenol Radium Ther Nucl Med 113: 680-1, 1971. A 676
- KLINGHOFFER M : Carbon monoxide poisoning. Illinois Med J 128: 310-2, 1965. A 677
- KRISHNAN S, KUPPUSWAMY G, MANI S and MAJID M A : Carbon monoxide poisoning. J Assoc Physicians India 19: 409-11, 1971. A 678
- KUROIWA Y : Carbon monoxide poisoning. Jap J Clin Med 25: 1647-52, 1967. A 679
- LAMY M and NOIRFALISE A : Intoxication oxycarbonée et gaz naturel. (Carbon monoxide and natural gas poisoning). Rev Med Liege 26: 128-33, 1971. A 680
- LeBRETON R and GARAT J : Intoxications oxycarbonées aiguës provoquées par fautes d'utilisateurs de poêles à combustibles solides. (Acute carbon monoxide poisoning caused by negligence in using a solid-fuel stove). Ann Med Leg (Paris) 44: 430-5, 1964. A 681

1005051283

Additional Bibliography List No. 15

- LeBRETON R and GARAT J: Intoxications oxycarbonées aiguës provoquées par fautes de'utilisation de appareils à combustibles gazeux ou liquides. (Acute monoxide poisoning caused by negligence in using gaseous or liquid fuel appliances). Ann Med Leg (Paris) 41: 435-43, 1964. A 682
- LEHR E L: Carbon monoxide poisoning: A preventable environmental hazard. Am J Public Health 60: 289-93, 1970. A 683
- MACHATA G: Die differenzierung der Kohlenoxidvergiftung. (The distinction of carbon monoxide poisoning). Arch Toxik (Germany) 23: 136-40, 1968. A 684
- MARI E and RIZZATTI E M: Ulteriori osservazioni in tema di intossicazione da ossido di carbonio e sindrome generale dell'adattamento. (Latest observations on the subject of carbon monoxide poisoning and general adaptation syndrome). Minerva Medicoleg 84: 162-7, 1964. A 685
- McDAY A J: Law-Medicine notes. Carbon monoxide poisoning. New Eng J Med 272: 252-3, 1965. A 686
- McNALLY W D: Carbon monoxide poisoning. Illinois Med J 59: 383-88, 1931. A 687
- MENZ M J: Ein pseudogift. (A pseudo-poison). Int Arch Gewerbepath (Germany) 22: 230-5, 1966. A 688
- MÜLLER G M and HUNG N: Einige daten zu fragen der tödlichen CO-vergiftung. (Some data on the problem of lethal CO-poisoning). Z Aerztl Fortbild (Jena) 62: 761-6, 1968. A 689
- MUROFUSHI K and MINAGAWA M: (Case of carbon monoxide poisoning with aging phenomena). Advances Neurol Sci (Tokyo) 13: 39-48, 1969. A 690
- OBERSTEG J I and DELAY F: 6 Jahre erfahrungen mit entgiftetem kochgas. (6 years of experience with detoxicated cooking gas.) Deutsch Z Ges Gerichtl Med 58: 122-6, 1966. A 691
- PETIT A G, PETIT G and GEILLE A: Contribution a l'étude étiologique de l'intoxication oxycarbonée. (Etiology of carbon monoxide poisoning). Med Leg Domm Corpor (Paris) 3: 278-82, 1970. A 692
- POLIARD J A: Burns and carbon-monoxide poisoning. Brit J Surg 57: 635-7, 1970. A 693
- RITUCCI A and LUVONI R: Rilievi medico-legali su casi plurimi mortali di acuta intossicazione ossi-carbonica con riferimento alla cronologia della morte. (Medico-legal findings on plural fatal cases of acute carbon monoxide intoxication with reference to chronology of death). Minerva Medicoleg 85: 45-51, 1965. A 694
- ROSE E F: Carbon monoxide intoxication and poisoning. J Iowa Med Soc 59: 909-17, 1969. A 695
- ROSENTHAL S G: Lethality of carbon monoxide in fires. New Eng J Med 279: 111-2, 1968. A 696
- SATO K, KIYOTANI T, MINAGI Y and KONDO M: Isolation and identification of narcotics by thin layer chromatography. 4. Isolation and identification of narcotics in carbon monoxide poisoning. Jap J Leg Med 20: 6-10, 1966. A 697
- SIASEV A N: (A severe case of carbon monoxide poisoning with a favorable outcome). Vrach Delo 11: 126-7, 1966. A 698
- SMITH J S and BRANDON S: Acute carbon monoxide poisoning - 3 years experience in a defined population. Postgrad Med J 46: 65-70, 1970. A 699
- STICHINOTH E and ZUMBANSEN H: Über farbveränderungen von leichenorganen nach CO-vergiftung bei spätexhumierung. (Changes in color of cadaver organs following CO-intoxication in late exhumation). Beitr Gerichtl Med 27: 237-41, 1970. A 670

1005051284

Additional Bibliography, List no. 15

- SUCHCICKI L : Uwagi medyka sądowego dotyczące wczesnego rozpoznania zatrucia tlenkiem węgla. (Remarks of a forensic medicine specialist concerning the early diagnosis of carbon monoxide). Wiad Lek 23: 1563-5, 1970. A 671
- THOMSON W : Carbon monoxide poisoning. Nurs Times 67: 668-9, 1971. A 672
- TOTSUKA S, MORO K, HORIE T and YAZAKI M : (Continuous and prolonged symptoms in 2 cases of gas poisoning). Adv Neurol Sci (Tok) 15: 592-605, 1971. A 673
- TOYA G : A clinical study on carbon monoxide poisoning. J Kumamoto Med Soc 41: 377-420, 1967. A 674
- TRAKHTENBERG S A : (The clinical picture of acute carbon monoxide poisoning). Klin Med (Moskva) 44: 112-5, 1966. A 675
- TUTT J B : Carbon monoxide poisoning. Vet Rec 87: 107-8, 1970. A 676
- VICH V : (Problems of carbon monoxide poisoning). Cas Lek Cesk 108: 1485, 1969. A 677
- VIOLET M M and PERROT E : Intoxications par l'oxyde de carbone. (Carbon monoxide poisoning). J Med Lyon 48: 81-6, 1967. A 678
- VIVOLI G and PREITE E : Sulla corruzione dell'aria degli ambienti riscaldati da stufe a gas liquido. (On air pollution in rooms heated with liquid gas stoves). Riv Ital Ig 26: 113-26, 1966. A 679
- VORONCHUCK G Z : (A rare case of severe carbon monoxide poisoning). Klin Med (Moskva) 44: 115-6, 1966. A 680
- WATANABE S, KITAGUCHI T, KIYOFUJI T, MORISAKI Y, MASUDA T, NOGUCHI K and MATSUMOTO S : An autopsy case of CO gas poisoning by incomplete combustion of fuel propane gas. J Kumamoto Med Soc 44: 354-8, 1970. A 681
- WATSON E S : Four cases of carbon monoxide poisoning in one family. S Dakota J Med 21: 15-8, 1968. A 682
- WEIGT H : Ungewöhnlicher verlauf einer Kohlenoxydgasvergiftung bei einem Ehepaar. (Unusual course of carbon monoxide poisoning in a married couple. Psychiat Neurol Med Psychol (Leipzig) 19: 147-52, 1967. A 683
- WILSON E F, RICH T H and MESSMAN H C : The hazardous hibachi. Carbon monoxide poisoning following use of charcoal. JAMA 221: 405-6, 1972. A 684
- ZORN H : Zur diagnostik der chronischen kohlenoxydvergiftung. (On the diagnosis of chronic carbon monoxide poisoning). Russ Med Industr 33: 325-9, 1964. A 685

1005051285

Additional Bibliography List No. 16

INDUSTRIAL POISONING INVOLVING CARBON MONOXIDE

- ALEKSANDROV V N, BESCHICHLOW D I, DAVIDOV O V : (Pathogenesis of poisoning by gun-powder gases). Voen Med Zh 7: 28-30, 1970. Reprint A 686
- ANON : Hazards in gasworks. Brit Med J 5439: 876-7, 1965. A 687
- BASMADZHEVA K, KURCHATOWA G, DAVYDKOVA E and TSWETANOV J : (The character of the combined action of sulfurous gas and carbon monoxide in their simultaneous presence in the atmosphere). Gig Sanit (Russia) 33: 73-7, 1968. A 688
- BRIGATTI L, PARIGI A and VARETTO L : Sul rischio di ossicarbonismo in una industria metal-meccanica. (On the risk of carbon monoxide poisoning in a metal machine factory). Rass Med Industr (Italy) 33: 417-9, 1964. A 689
- BUCKLEY A R and FEAR E C : Precautions taken for the protection of workers in the British gas industry against carbon monoxide poisoning. Rass Med Industr 33: 296-308, 1964. A 690
- CAPELLARO F : Aspetti di prevenzione medica in una moderna officina di produzione di gas. (Aspects of medical prevention in a modern gas production plant). Rass Med Industr 33: 398-400, 1964. A 691
- CAPELLARO F and BRAGUZZI E : Su alcuni fattori limitanti l'idoneita' lavorativa in ambienti con rischio di intossicazione da co. (On some factors limiting work ability in areas with risk of carbon monoxide poisoning). Folia Med (Napoli) 47: 1068-73, 1964. A 692
- CASCINI F and GAZZERRO F : Saldatura elettrica ed ossicarbonismo. (Electrical welding and carbon monoxide poisoning). Folia Med (Napoli) 49: 433-46, 1966. A 693
- COSIC V, ARSENIJEVIC M, KANDIC B and GRBESA B : Akutno trovanje ugljen-monoksidom u rudniku Banovici. (Acute carbon monoxide poisoning in the mine). Vojnosanit Pregl 21: 157-64, 1964. A 694
- DATSENKO I I : (The carbon monoxide content of the air in the foundry shop of the "Avtopogruzchik" factory). Gig Tr Prof Zabol 9: 55, 1965. A 695
- DEANE M, GOLDSMITH J R and TUMA D : Respiratory conditions in outside workers. Arch Environ Health (Chicago) 10: 323-331, 1965. A 696
- DE KRETZER A J, EVANS W D and WALDRON H A : Carbon monoxide hazard in the CO₂ arc-welding process. Ann Occup Hyg 7: 253-9, 1964. A 697
- DESBAUMES P : Intoxications mortelles par les gaz de fermentation de silos agricoles (oxyde de carbone et oxydes d'azote). (Fatal poisoning by silo gases (carbon monoxide and oxides of nitrogen). Arch Toxic 23: 160-4, 1968. A 698
- DETTORI G and SCANSETTI G : Importanza del controllo dell'efficienza degli impianti industriali ai fini della prevenzione dell'ossicarbonismo. (Importance of the inspection of the efficiency of industrial installations for the purpose of prevention of carbon monoxide poisoning). Rass Med Industr 33: 394-7, 1965. A 699
- FIRST M W and MURPHY R L H : Carbon monoxide exposures from snow melting machines. Am Ind Hyg Assoc J 31: 754-7, 1970. A 700
- GERITSEN W B : Quelques aspects de la prevention de l'oxycarbonisme des travailleurs. (Some aspects of the prevention of carbon monoxide poisoning in workers). Rass Med Industr 33: 356-9, 1964. A 701

1005051286

Additional Bibliography List No. 16

- GUEPIN : A propos de'un cas d'oxycarbonisme présumé en cale. (A case of poisoning by carbon monoxide presumably from a ship's hold). Arch Mal Prof 30: 355-7, 1969. A 702
- JORDI A : Gewerbliche toxiologie und soziale medizin. (Industrial toxicology and social medicine). Praxis 57: 785-93, 1968. A 703
- KEMKES B : Berufskrankheiten durch gasförmige gifte. (Occupational gaseous poisonings). Med Klin 37: 109-11, 1941. A 704
- LUNDEVALL J : Carbon monoxide intoxication from insulation of electric cable. Med Sci Law 12: 203-4, 1972. A 705
- MARANZANA P, TRONZANO L and COSCIA G : Su due successivi episodi di intossicazione da ossido di carbonio in uno stesso gruppo di operai friggitori. (On 2 successive episodes of carbon monoxide poisoning in the same group of workers engaged in potato-chip frying). Rass Med Industr 33: 407-10, 1964. A 706
- MARCHIARO G, MARGARIA E, GAIDO P C and AQUARO G : Equilibrio acido base nell'intossicazione acuta sperimentale da ossido di carbonio. (Acid-base equilibrium in acute experimental carbon monoxide poisoning). Rass Med Industr 33: 452-3, 1964. A 707
- MONACO B : L'ossicarbonismo e la determinazione del CO negli ambienti di lavoro ricerche in una grande officina per la produzione del gas di città. (Carbon monoxide poisoning and carbon monoxide determination in work areas. Research in a large workshop for city gas production). Rass Med Industr 33: 495-527, 1964. A 708
- MOSS C J : Machinery hazards. Ann Occup Hyg 12: 69-75, 1969. A 709
- REPLOH H, KLOSTERKÖTTER W and EINCK-ROSSKAMP P : Zur frage der toxizität von kunststoff-verschmelungsprodukten. (On the problem of the toxicity of products of the carbonization of plastics). Arch Hyg Bakt 150: 393-405, 1966. A 710
- RODKEY F L, COLLISON H A and ENGEL R R : Release of carbon monoxide from acrylic and polycarbonate plastics. J Appl Physiol 27: 554-5, 1969. A 711
- ROSSO M and DUGHERA L : Problemi d'inquinamento da CO in ambiente metalmeccanico pesante. (Problems of air pollution with CO in heavy metal machine factories). Rass Med Industr 33: 354-5, 1964. A 712
- SADOKIERSKI W : Obraz krwi obwodowej u pracowników zakładów suchej destylacji drewna. (Peripheral blood picture in workers employed in dry wood distillation). Med Pracy 16: 61-5, 1965. A 713
- SCHAFFERNICHT H, ZIEGLER V and REINHARD H : Untersuchungen über die gefährdung durch Kohlenmonoxid in Räucheröfen. (Studies on carbon monoxide hazards in smoke-houses). Z Gesamte Hyg 16: 503-8, 1970. A 714
- SCHIECHE M, KE LER M and KOBER S : Erhebungen zum Krankenstand eines hochofenbetriebes. (Data on sickness in a blast furnace steel plant). Z Aerztl Fortbild (Jena) 64: 617-21, 1970. A 715
- SCHÜTTMANN W : Berufliche intoxicationen unter dem bilde vegetativer dysregulationen. (Occupational poisoning under the clinical picture of vegetative dysregulations). Z Aerztl Fortbild (Jena) 62: 1-8, 1968. A 716
- SHIRABE T, MAWATARI S and KUROIWA Y : (Autopsy case of carbon monoxide poisoning at the Miike coal mine explosion. A case of lung cancer with the fatal outcome in 3 years and 4 months). Advances Neurol Sci (Tokyo) 321-6, 1970. A 717

1005051287

Additional Bibliography List No. 16

- SIEGRIST H: Die gefährlichkeit der Flüssiggase. (The danger of liquid gases). Deutch Z Ges Gerichtl Med 57: 158-61, 1966. A 718
- STEWART R D, FISHER T N, HOSKO M J, PETERSON J E, BARETTA E D and DODD H C: Carboxyhemoglobin elevation after exposure to dichloromethane. Science 176: 295-6, 1972. A 719
- SUPFLE: Zur frage der chronischen Kohlenoxydvergiftung. (Chronic carbon monoxide poisoning). Med Klin 29: 1727, 1933. A 720
- TATETSU S, TOYA G, MIMURA K, HARADA M and TSUKAYAMA T: (A four-year clinical follow-up study of mass carbon monoxide poisoning due to a coal-mine explosion.) Advances Neurol Sci (Tok) 13: 11-19, 1969. A 721
- TEBBENS B D and SPEAR R C: Quality control of work environments. Am Ind Hyg Assoc J 32: 546-51, 1971. A 722
- THURSTON G: The lethal boiler flue. Medicoleg J 36: 191-6, 1968. A 723
- VENGERSKAIA K, NAZYROV G N, BOPROVA L S, DUBROVSKY S J and DUMKO V P: (Sanitation-chemical assessment of the use of new synthetic materials under hot climatic conditions). Gig Sanit 33: 23-4, 1968. A 724
- VUOPALA U, HUHTI E, TAKKUNEN J and HUIKKO M: Nickel carbonyl poisoning. Report of 25 cases. Ann Clin Res 2: 214-22, 1970. A 725
- WAGNER F J: Reihenuntersuchungen bei Kohlenoxydexponierten. (Mass examinations of persons exposed to carbon monoxide). Z Ges Hyg 10: 621-7, 1964. A 726
- WOHLERS H C, NEWSTEIN H and DAUNIS D: Carbon monoxide and sulfur dioxide adsorption on - and desorption from glass, plastic and metal tubings. J Air Pollut Contr Ass 17: 753-6, 1967. A 727
- ZARIVAISKALA K: (Pollution of the air of gas-supplied dwellings with various ventilation systems). Gig Sanit 31: 100-2, 1966. A 728

1005051288

Additional Bibliography List No. 17

THERAPY OF CARBON MONOXIDE POISONING

- AQUINAS M : Coal gas poisoning: a nursing care study. Nurs Times 60: 1208-10, 1964. Reprint A 729
- BEGHE¹ RAOUL : Esperienze in tema di trattamento dell'ossicarbonismo acuto. (Experience in the treatment of acute carbon monoxide poisoning). Rass Med Industr 33: 337-48, 1964. A 730
- BELAISCH J : La plasmathérapie. (Plasmotherapy.) Vie Med Paris 35: 999-1002, 1954. A 731
- BORBÉLY F : Die behandlung der kohlenoxydvergiftungen. (Treatment of carbon monoxide poisoning). Deutsch Med Wschr 90: 1963-4, 1965. A 732
- BOULETREAU P and MOTIN J : Etude d'une série homogène de 50 comas oxycarbonés traités par l'oxygénothérapie hyperbare. (Study of a homogeneous series of 50 cases of coma due to carbon monoxide poisoning and treated with hyperbaric oxygenation). Moroc Med 50: 386, 1970. A 733
- BOUR H, PASQUIER P and BERTRAND-HARDY J M : Le coma oxycarboné. Etude générale, clinique, biologique et thérapeutique de 290 cas. (Carbon monoxide coma. General study, clinical, biological and therapeutics of 290 cases). Sem Hop Paris 42: 1839-61, 1966. A 734
- BRANDON S : Treatment of carbon monoxide poisoning. Lancet 1: 626, 1970. A 735
- BURMEISTER H, BARCKOW D, HUMPERT U, IBE K and LERCHE D : Die künstliche beatmung. Ein erfahrungsbericht. (Artificial respiration. Report based on personal experience). Deutsch Med Wschr 93: 517-22, 1968. A 736
- BURMEISTER H and HEUHAU G A : Die behandlung der schweren subakuten leuchtgasvergiftung beim menschen. (Treatment of severe, subacute natural gas poisoning in humans). Arch Toxikol 26: 277-92, 1970. A 737
- CARUSO G and BARNABA A : Trattamento con diazepam e remissione della sintomatologia extrapiramidale in un caso di parkinsonismo da intossicazione con ossido di carbonio. (Treatment with diazepam and remission of the extrapyramidal symptoms in a case of parkinsonism caused by carbon monoxide poisoning). Acta Neurol Napoli 23: 103-10, 1968. A 738
- CENTI R and ZAFFIRI O : Considerazioni su di un caso gravissimo di ossicarbonismo acuto favorevolmente risolto con acido ascorbico ad alte dosi e con l-dopa. (On a very grave case of acute carbon monoxide poisoning favorably resolved with high doses of ascorbic acid with L-dopa). Minerva Anesthesiol 37: 406-14, 1971. A 739
- CHUKHRIENKO D P and LULKO A V : (Extrarenal hemodialysis in carbon monoxide poisoning). Vrach Delo 12: 18-21, 1968. A 740
- CIOCATTO E and PATTONO R : Organizzazione di un centro di rianimazione respiratoria terapia dell'intossicazione acuta da ossido di carbonio. (Organization of a respiratory resuscitation center. Therapy of acute carbon monoxide poisoning). Rass Med Industr 33: 330-3, 1964. A 741
- COLLINS J V and GOULDING R : Treatment of acute poisoning at Guy's Hospital: October 1969 to September 1970. Guys Hosp Rep 120: 31-46, 1971. A 742
- DAMIA G, SIBILIA E and DAMIA G : Considerazioni sulla prognosi e trattamento di alcuni casi di avvelenamento da barbiturici e da CO. (Considerations on the prognosis and treatment of some cases of poisoning due to barbiturates and carbon monoxide). Minerva Anest 31: 564-8, 1965. A 743

1005051289

Additional Bibliography List No. 17

- ESTLER C J : Über Veränderungen des Hirnstoffwechsels nach akuter Kohlenmonoxydvergiftung und über den Einfluss von Natriumsuccinat auf die Kohlenmonoxydvergiftung. (On changes in brain metabolism following acute carbon monoxide poisoning and about the effect of sodium succinate on carbon monoxide poisoning). Arch Int Pharmacodyn 158: 415-28, 1965. A 744
- FOURNIER E : Traitement de l'intoxication oxycarbonée aiguë. (Treatment of acute carbon monoxide poisoning). Cah Coll Med Hop Paris 8: 1227-30, 1967. A 745
- GAULTIER M, FOURNIER E, GERVAIS P, EFTHYMIU M L, SRAER C, BISMUTH C, BODIN F, CHRISTOFOROV B, SICOT C and FREJAVILLE J P : Travail du secteur de réanimation de la clinique toxicologique pendant l'année 1967. (Work of the resuscitation center of the Toxicology Clinic during the year 1967). Bull Soc Med Hop Paris 119: 75-86, 1968. A 746
- GERBER H U and SEEWALD H : Pathophysiologie und Therapie der akuten Kohlenmonoxidvergiftung. (Pathophysiology and therapy of acute carbon monoxide poisoning). Z Aerztl Fortbild (Jena) 60: 1085-92, 1966. A 747
- GLÄSEL E : Häufigkeit und organisierte Bereitschaft bei der Behandlung exogener Intoxikationen. (Incidence and organized readiness in the treatment of exogenous intoxications). Z Gesamte Inn Med 7: 195-8, 1970. A 748
- GOTO H : (First aid in gas poisoning in large cities). Naika 22: 251-6, 1968. A 749
- GOULDING R : The treatment of acute poisoning. Trans Med Soc London 83: 9-18, 1967. A 750
- GOULON M, BAROIS A, RAPIN M, NOUAILHAT F, AUGUSTIN P, HENNETIER G, BAGUET J C, KUNTZIGER H and BRETEAU M : Traitement de l'intoxication oxycarbonée par l'oxygène hyperbare (à propos de 20 observations). (Treatment of carbon monoxide poisoning with hyperbaric oxygenation. Apropos of 20 cases). Bull Soc Med Hop Paris 116: 649-71, 1965. A 751
- GOULON M, BAROIS A, GAJDOS P, LABROUSSE J, SCHORTGEN G, AMERONGEN G and ROBERT J F : Problèmes physiopathologiques et thérapeutiques posés par l'œdème aigu pulmonaire toxique. (Physiopathologic and therapeutic problems raised by acute toxic pulmonary edema). Poumon Coeur 26: 1039-65, 1970. A 752
- HEYNDRICKX A, SCHEIRIS C, VERCRUYSE A and OKKERSE E : Gas chromatographic determination of carbon monoxide in blood and the hyperbaric oxygen treatment in carbon monoxide poisoning cases. J Pharm Belg 25: 247-58, 1970. A 753
- KILLICK E M and MARCHANT J V : The effect of barbiturates on the resuscitation of dogs from severe acute CO poisoning. J Physiol London 180: 80-95, 1965. A 754
- LAVERNE A A : Carbon dioxide therapy, healing, and air pollution. A more effective rapid coma technic for psychiatric disorders. Behav Neuropsychiat 2: 10-25, 1970. A 755
- LEVIN M : Smoke poisoning treated by antacids. J Med Soc New Jersey 62: 215-6, 1965. A 756
- LIZANETS M N and ZARKEVICH U P : (Experience with intensive therapy in cases of acute poisoning by automobile exhaust and carbon monoxide. Voen Med Zh 11: 72-4, 1971. A 757
- MATTHEW H : Treatment of carbon monoxide poisoning. Lancet 1: 518, 1970. A 758
- NIELSEN B : Thermoregulation during work in carbon monoxide poisoning. Acta Physiol Scand 82: 98-106, 1971. A 759
- NORMAN J N and LEDINGHAM I M : Carbon monoxide poisoning: Investigations and treatment. Progr Brain Res 24: 101-22, 1967. A 760
- NOUAILHAT F : Conduite à tenir en présence d'une intoxication oxycarbonée aiguë. (Procedure to follow in the presence of acute carbon monoxide poisoning). Progr Med Paris 92: 537-45, 1964. A 761

1005051290

Additional Bibliography List No. 17

- OKULOVSKI V K and HACHATUROV G S : (Resuscitation of patients in severe forms of carbon monoxide poisoning). Voen Zh 11: 66-7, 1968. A 762
- OTSUKI S, NINOMIYA K, YAMAMOTO M, NAKASHIMA Y, SHUTARA M, URAKAMI S and ITAMI Z : (Effect of cytidine monophosphate on the organic syndrome in the brain.)Brain Nerve (Tokyo) 18: 745-9, 1966. A 763
- PAPAVASILIOU P S, COTZIAS G C, DUBY S E, STECK A J, FEHLING C and BELL M A : Levodopa in parkinsonism: Potentiation of central effects with a peripheral inhibitor. N Engl J Med 285: 8-14, 1972. A 764
- PAULET G and CHEVRIER R: De l'action du cobalt sur la détoxication oxycarbonée. (On the action of cobalt on carbon monoxide detoxication). C R Soc Biol Paris 163: 1199-202, 1969. A 765
- PECORA L : La terapia ferrosa nell'ossicarbonismo acuto. (Iron therapy in acute carbon monoxide poisoning). Russ Med Industr 33: 352-3, 1964. A 766
- PLACE M : For each his own: the self-rescuer apparatus against CO. Occup Health London 22: 107-11, 1970. A 767
- PUKHOV V A : (Pathogenesis and complex treatment of CO poisoning). Biul Eksp Biol Med 60: 39-42, 1965. A 768
- RADUSHVICH V P : (Auxiliary extracorporeal circulation for resuscitation). Khirurgia Moskva 44: 3-8, 1968. A 769
- RAPOPORT K M : (On the feasibility of using methylene blue in carbon monoxide poisoning). Voen Zh 12: 34-5, 1967. A 770
- REJSEK K : (News in the therapy of poisoning by industrial agents). Cas Lek Cesk 110: 133-4, 1971. A 771
- RIZZI R : La rianimazione nell'avvelenamento da CO. (Resuscitation in CO poisoning). Minerva Anest 34: 1454-6, 1968. A 772
- SALNIS A N and HACHATUROV G S : (Resuscitation measures in the treatment of acute carbon monoxide poisoning). Voen Med Zh 11: 32-4, 1970. A 773
- SNASHALL P D : Treatment of carbon monoxide poisoning. Lancet 1: 357-8, 1970. A 774
- TATEGAMI T : Treatment of acute carbon monoxide poisoning from the point of view of pathophysiology. J Kuunamoto Med Soc 42: 318-38, 1968. A 775
- THURSTON J : Treatment of carbon monoxide poisoning. Lancet 1: 468-9, 1970. A 776
- TORELLI G : Meccanismo dell'azione tossica da CO e principi terapeutici conseguenti. (Mechanism of the toxic action of CO and consequent therapeutic principles). Rass Med Industr 33: 458-64, 1964. A 777
- TOWNSEND G L and STETSON J B : Treatment of carbon monoxide poisoning by mechanical ventilation: Case report. Canad Anaesth Soc J 15: 184-96, 1968. A 778
- WAGNER K D and RICHTER D : Exogene Ursachen, Behandlung und klinische Spätfunde bei Vergiftungen im Kindesalter. (Exogenous causes, treatment and late clinical findings in poisoning during childhood). Z Aerztl Fortbild (Jena) 62: 492-7, 1968. A 779
- WATABE Y : (Emergency treatment in respiratory management) Sanfujinka Jissai 18: 496-506, 1969. A 780

1005051291

Additional Bibliography List No. 17

- ZAFFIRI O : L'ipotermia nella rianimazione dell'avvelenamento acuto da ossido di carbonio considerazioni su un caso clinico. (Hypothermia in resuscitation in acute carbon monoxide poisoning. Considerations on a clinical case). Rass Med Industr 33: 433-6, 1964. A 781
- ZAFFIRI O, CALÀ G, CENTI R and SALICONE A : Un nuovo metodo terapeutico dell'ossicarbonismo acuto grave (metodo di Calà-Zaffiri) con infusioni venose di alte dosi di acido ascorbico. (A new method of treatment of grave acute carbon monoxide poisoning (Calà-Zaffiri method) with venous infusions of large doses of ascorbic acid). Minerva Anest 37: 332-9, 1971. A 782
- ZIBEROV S G : (Complex treatment of home carbon monoxide poisoning). Vrach Delo 10: 99-100, 1966. A 783

1005051292

Additional Bibliography List No. 18

THERAPY OF POISONING BY USE OF NORMAL AND HYPERBARIC OXYGEN

- | | |
|--|------------------|
| ALVIS H J : What hyperbaric medicine has to offer the industrial physician. <u>J Occup Med</u> 9: 304-7, 1967. | Reprint
A 784 |
| ANON : Hyperbaric medicine. <u>Brit Med J</u> 1: 312-3, 1969. | A 788 |
| ANON : Hyperbaric oxygen therapy. <u>Med Lett Drugs Ther</u> 13: 29-32, 1971. | A 789 |
| ASCORBE DOMINGUEZ A : Cinco casos de intoxicacion por monoxido de carbono tratados con oxigeno hiperbarico. (5 cases of carbon monoxide poisoning treated with hyperbaric oxygenation). <u>Rev Esp Anest</u> 16:542-4, 1969. | A 790 |
| BARTHÉLEMY L, PARC J, MICHAUD A and MATHÉ P : L'oxygène hyperbare dans le cadre de la marine nationale expérience de 10 ans. (Hyperbaric oxygen in the national Navy. Ten years' experience). <u>Anesth Analg Paris</u> 24: 375-86, 1967. | A 791 |
| BEREZIN I P and PUZARES V A : (The therapeutic effect of oxygen under high pressure). <u>Klin Med Moskva</u> 47: 32-8, 1969. | A 792 |
| BERNHARD W F and FILLER R M : Hyperbaric oxygenation: Current concepts. <u>Am J Surg</u> 115: 661-8, 1968. | A 793 |
| BESZNYÁK I : Die hyperbare Sauerstoffbehandlung in der Medizin. (Hyperbaric oxygenation therapy in medicine). <u>Z Aerztl Fortbild (Jena)</u> 61: 985-91, 1967. | A 794 |
| BIMONTE D, PORTOLANO F and TUFANO R : L'ossigenoterapia iperbarica nel trattamento della intossicazione acuta da ossido di carbonio. (Hyperbaric oxygen therapy in the treatment of acute carbon monoxide poisoning). <u>Rass Int Clin Ter</u> 51: 364-9, 1971. | A 795 |
| BOCCALETTI E, NOFRINI U, JOSI G and MAGGIO G : L'ossigenoterapia iperbarica e le sue applicazioni cliniche. (Hyperbaric oxygen therapy and its clinical uses). <u>Policlinico (Prat)</u> 73: 1157-70, 1966. | A 796 |
| BRUSADELLI S, PALMA G and DiPRETORO L : Il problema del monitoraggio durante il trattamento terapeutico in camera iperbarica. (The problem of monitoring during therapeutic treatment in the hyperbaric chamber). <u>Acta Anaesth (Padova)</u> 8: 363-81, 1968. | A 797 |
| BULTERIJS A : Application of oxygen under high atmospheric pressure. <u>Int Nurs Rev</u> 12: 20-2, 1965. | A 798 |
| BURSTON G R : Self-poisoning in elderly patients. <u>Geront Clin (Basel)</u> 11: 279-89, 1969. | A 799 |
| CAILAR J, SERRE L, ROQUEFFEUIL B, LEFEBVRE F and MALZAC P : Résultats du traitement de l'intoxication oxycarbonée par l'oxygène hyperbare. A propos de 43 observations. (Results of the treatment with hyperbaric oxygen of carbon monoxide poisoning. Apropos of 43 cases). <u>Sem Hop Paris</u> 44: 3155-60, 1968. | A 800 |
| CHEW H E R, HANSON G C and SLACK W K : Hyperbaric oxygenation. <u>Brit J Dis Chest</u> 63: 113-39, 1969. | A 801 |
| CHICHET-GOSSET C, CHASSON J, OHRESSER P, ARNAUD A and DUBOULOZ F : Les comas toxiques dans une unité de réanimation respiratoire. Bilan de trois années. (Toxic comas in a respiratory resuscitation unit. A 3-year observation). <u>Poumon Coeur</u> 23: 721-7, 1967. | A 802 |
| CIOCATTO E, PATTONO R, QUERCI M and ZAFFIRI O : L'ossigenazione iperbarica in rianimazione. (Hyperbaric oxygenation in resuscitation). <u>Minerva Anest</u> 32: 97-9, 1966. | A 803 |

1005051293

Additional Bibliography List No. 18

- DEEN L : Hyperbare oxygenierung. (Hyperbaric oxygenation) Anaesthesist 18: 205-7, 1969 A 804
- DuCAILLAR J, LEFEBVRE F, ROQUEFEUIL B, MALZAC P and PROST T J : Oxygénothérapie hyperbare et intoxication oxycarbonée. A propos de 100 cas. (Hyperbaric oxygenation and carbon monoxide poisoning. Apropos of 100 cases). Moroc Med 50: 383-5, 1970. A 805
- GERHARDT T, GÖTHERT M, MALORNY G and WILKE H : Zur Frage der Toxizität von Kohlenoxid bei Atmung von CO-Luftgemischen unter erhöhtem Druck. (Carbon monoxide toxicity during the breathing of CO and air mixtures under hyperbaric pressure). Int Arch Arbeitsmed 28: 127-40, 1971. A 806
- GOULON M and HENNETIER G : Traitement de l'intoxication oxycarbonée par l'oxygène hyperbare. (Treatment of carbon monoxide poisoning by hyperbaric oxygen). Ann Chir Thorac Cardio 5: 619-23, 1966. A 807
- GOULON M, LEVY-ALCOVER M A, NOUAILHAT F and DORDAIN G : Étude de l'E. E. G. au cours de l'oxygénothérapie hyperbare. (Study of the EEG in the course of hyperbaric oxygen therapy). Rev Neurol Paris 117: 521, 1967. A 808
- GOULON M, BAROIS A, RAPIN M, NOUAILHAT F, GROSBUS S and LABROUSSE J : Intoxication oxycarbonée et anoxie aiguë par inhalation de gaz de charbon et de hydrocarbures. (Carbon monoxide poisoning and acute anoxia due to inhalation of coal gas and hydrocarbons). Ann Med Interne Paris 5: 335-49, 1969. A 809
- GOULON M, LÉVY-ALCOVER M A, NOUAILHAT F and DORDAIN G : The EEG in hyperbaric oxygen therapy. Clin Neurophysiol 25: 90, 1968. A 810
- GRAMER L and BECKENKAMP H : Über die Abatmung von Kohlenmonoxyd bei Vergifteten unter Sauerstoffbeatmung. (On the expiration of carbon monoxide in poisoned persons treated with oxygen inhalation). Int Arch Gewerbepath 22: 282-96, 1966. A 811
- GRAZIANI G and PAGGIE : Trattamento dell'ossicarbonismo acuto sperimentale con ossigeno iperbarico. (Treatment of experimental acute carbon monoxide poisoning by hyperbaric oxygen). Folla Med Napoli 48: 1219-29, 1965. A 812
- HANQUET M and LAMY M : L'oxygénothérapie hyperbare en caisson monoplace à oxygène pur. (Hyperbaric oxygen therapy in a caisson using pure oxygen). Laval Med 42: 647-67, 1971. A 813
- HIRANO H, INOUE Y and TANAMI J : Studies on the mode of actions of carbon monoxide. 3rd report: The central action of carbon monoxide. Jap J Hyg 25: 488-93, 1971. A 814
- IWANOWSKA H : O możliwościach leczenia tlenem stosowanym pod zwiększonym ciśnieniem. (On the possibilities of treatment with hyperbaric oxygenation). Pol Tyg Lek 22: 1981-3, 1967. A 815
- JACOBSEN E : The theory and indications of hyperbaric oxygen. A review. Laval Med 42: 291-300, 1971. A 816
- KOKAME G M and SHULER S E : Carbon monoxide poisoning. Arch Surg 96: 211-5, 1968. A 817
- MAEROVICH I M :
KONDRASHENKO V T, GLANTS B R, and / (Hyperbaric oxygen therapy of hypoxic states in acute cranio-cerebral trauma and acute exogenous psychoses). Zh Nevropatol Psikhiatr 71: 271-7, 1971. A 818
- KUCHER R and RIEDEL W : Die Behandlung des Gasbrandes in der Sauerstoffüberdruckkammer. (Treatment of gas gangrene in hyperbaric oxygenation chamber). Wien Klin Wochenschr 81: 308-10, 1969. A 819
- LAMY M and HANQUET M : L'oxygénothérapie hyperbare. Premières applications. (Hyperbaric oxygenotherapy. First applications) Acta Anaesth Belg 19: 46-82, 1968. A 820

1005051294

Additional Bibliography List No. 18

- LAMY M and HANQUET M : Cinquante cas d'intoxication oxycarbonée traités par l'oxygénothérapie hyperbare. (Fifty cases of carbon monoxide poisoning treated by hyperbaric oxygenation). Acta Anaesthesiol Belg 20: 49-64, 1969. A 821
- LARCAN A, ROBERT J, CALAMAI M and FREJAVILLE J P : Le traitement de l'intoxication oxycarbonée par le caisson mobile d'oxygénation hyperbare. Premiers résultats. (Treatment of carbon monoxide poisoning using a mobile hyperbaric oxygenation unit. 1st results) Presse Med 75: 1325-9, 1967. A 822
- LEDINGHAM I M: New approaches to poisoning. Hyperbaric oxygenation. Proc Roy Soc Med 57: 807-9, 1964. A 823
- LEE K : The use of portable oxygen sets in carbon monoxide poisoning. Trans Soc Occup Med 16: 85-6, 1966. A 824
- MANTZ J M and TEMPE J D : L'ossigenoterapia iperbarica. (Hyperbaric oxygen therapy). Minerva Med 59: 3137-49, 1968. A 825
- MANTZ J M and TEMPE J D : Die Sauerstoff-Uberdruckbehandlung. (Treatment with hyperbaric oxygen). Munch Med Wochensh 110: 2186-97, 1968. A 826
- MATTHEW H : Mobile pressure chamber. Brit Med J 600, 1970. A 827
and BAYLISS G J A
- MILLER J N A: Clinical applications of hyperbaric oxygen therapy in Sydney - a review of recent cases. Med J Aust 1: 835-8, 1966. A 828
- MOLFINO F and ZANNINI D: Sulla cura dell'ossicarbonismo acuto mediante ossigenoterapia in camera pressurizzata. (On the treatment of acute carbon monoxide poisoning by oxygen therapy in a pressure chamber. Rass Med Industr 33: 334-6, 1964. A 829
- NORMAN J N, MacINTYRE J, SHEARER J R and SMITH G : Use of a one-man mobile pressure chamber in the treatment of carbon monoxide poisoning. Brit Med J 2: 333-4, 1970. A 830
- OHRESSER P, CHASSON J, JOUGLARD J, GOUIN F, DUBOULOZ F and TASSY J : Traitement hyperbare des intoxications oxycarbonées. (Hyperbaric treatment of carbon monoxide poisoning). Marseille Med 105: 555-7, 1968. A 831
- PETTY T L : Oxygen therapy. Ann Intern Med 71: 666-7, 1969. A 832
- ROCHE L, BERTOYE A, VINCENT P, MOTIN J, GARIN J P, BOLOT J F and CHADENSON O : Comparaison de deux groupes de vingt intoxications oxycarbonées traitées par oxygène normobare et hyperbare. (Comparison of 2 groups of 20 cases of carbon monoxide poisoning treated with normobaric and hyperbaric oxygen. Lyon Med 220: 1483-99, 1968. A 833
- SAVATEEV N V, TONKOPIJ V D and FROLOV S F : (Hyperbaric oxygenation in certain types of acute poisoning. Review of the literature). Voenn Med Zh 2: 23-8, 1970. A 834
- SCHULTE J H : The use of hyperbaric oxygen in clinical medicine. J Occup Med 11: 462-5, 1965. A 835
- SIMPSON B R and RITCHIE H D : Expérience personnelle du traitement à l'oxygène à haute pression. (Personal experience with high pressure oxygen therapy). Lyon Chir 64: 5-12, 1968. A 836
- SLUIJTER M E : The treatment of carbon monoxide poisoning by administration of oxygen at high atmospheric pressure. Progr Brain Res 24: 123-82, 1967. A 837
- SMITH G : Carbon monoxide poisoning. Ann NY Acad Sci 117: 684-7, 1965. A 838
- SUGIMOTO T and YASUMITSU T : (Hyperbaric oxygen therapy of carbon monoxide poisoning). Jap J Clin Med 27: 2157-64, 1969. A 839

1005051295

Additional Bibliography List No. 18

- TAKEYA H, TAKANO M, TAMURA A, HOJO Y, YASUDA K, YOSIDA T and HURUKAWA Y :
(Carbon monoxide poisoning). Jap J Anesth 19: 172-9, 1970. A 840
- TEMMERMAN P and ETIENNE A : Résultats de l'oxygénothérapie hyperbare dans l'intoxication
oxycarbonée. (Results of hyperbaric oxygen therapy in carbon monoxide poisoning).
Acta Anaesthesiol Belg 20: 119-41, 1969. A 841
- THURSTON J : Hyperbaric oxygen in carbon monoxide poisoning. Brit Med J 4: 386, 1968. A 842
- THURSTON J G B : Place of hyperbaric oxygen in intensive care. Proc R Soc Med 64: 1287-8,
1971. A 843
- WERNITSCH W : Zur Technik und Anwendung der hyperbaren Oxygenation. (Technic and ad-
ministration of hyperbaric oxygenation). Med Welt 49: 2668- , 1969. A 844
- WINTER A and SHATIN L : Hyperbaric oxygen in reversing carbon monoxide coma. Neurolo-
gic and psychologic study. NY State J Med 70: 880-4, 1970. A 845
- ZORN H : Carbogen oder reiner Sauerstoff zur Beatmung bei Kohlenmonoxidvergiftung?
(Carbogen or pure oxygen for artificial respiration in carbon monoxide poisoning?)
Dtsch Med Wochenschr 93: 1536, 1968. A 846

1005051296

(Reprint number) followed by pages in the text.

- ABELSON 1967 (640) 114, 141
ABELSON 1968 (A 240) 192
ACHTEN, LEDOUX, CORBUSIER and
THYS 1971 (615) 112, 111
AFANSEV 1967 (392) 76, 74
AINSWORTH, SCHLOEGEL, DOMANSKI and
GOLDBAUM 1967 (A 1) 176
AINSWORTH 1968 (A 55) 180
AITKEN, BUGLASS and KREITMANN 1969
(A 617) 216
AITKEN, DALY, KREITMAN and
PROUDFOOT 1966 (A 460) 206
AJEMIAN and WHITMAN 1970 (A 318) 197
ALBEN and CAUGHEY 1968 (A 56) 180
ALEXANDRE 1967 (A 646) 218
ALEKSANDROV, BESCHOCHLOW and
DAVIDOV 1970 (A 686) 222
ALFSEN, CHIANCONE, ANTONINI, WAKS and
WYMAN 1970 (A 57) 180
ALIVISATOS, BAZAS, ALEXOPOULOS and
VERYKOKAKIS 1967 (168) 40, 38
ALPERT and BANERJEE 1971 (A 58) 180
ALVAPES, SCHILLING, LEVIN and
KUNTZMAN 1967 (A 544) 211
ALVARES, SCHILLING, LEVIN and
KUNTZMAN 1971 (A 545) 211
ALVIS 1967 (A 784) 229
AMENDT and REDDEMANN 1970 (A 618) 216
AMERICAN THORACIC SOCIETY 1966
(A 241) 192
AMYOT, GLARD and ROBERT 1967 (A 461)
206
ANDERHUB, HOFER and SCHERRER 1970
(A 2) 176
ANDERSEN and GIBSON 1971 (A 59) 180
ANDERSON 1971 (A 270) 194
ANDERSON 1967 (A 242) 192
ANDERSON, REED and CHANCE 1970
(A 60) 180
ANDERSON, ALLENSWORTH and DeGROOT
1967 (309) 64, 63
ANDERSON and ANTONINI 1968 (A 3) 176
ANDERSON 1970 (A 647) 218
ANDERSON 1971 (271) 59, 56
ANDERSSON 1972 (310) 64, 62
ANDO 1966 (A 462) 206
ANDO, SENO and HAGIWARA 1969 (498)
94, 93
ANON 1964 (A 463) 206
ANON 1965 (641) 114, 142
ANON 1966 (A 243) 192
ANON 1968 (A 465) 206
ANON 1968 (A 464) 206
ANON 1968 (643) 114, 144
ANON 1968 (642) 114, 143
ANON 1969 (A 619) 216
ANON 1969 (A 788) 229
ANON 1970 (A 649) 218
ANON 1970 (A 648) 218
ANON 1970 (A 271) 194
ANON 1971 (644) 114, 145
ANON 1971 (645) 114, 146
ANON 1971 (A 789) 229
ANON 1972 (A 319) 197
ANON 1972 (A 187) 189
ANTONINI, ANDERSON and MAURIZIO
1972 (A 65) 180
ANTONINI, BRUNORI, WYMAN and Noble
1966 (A 63) 180
ANTONINI, BUCCI, FRONTICELLI, WYMAN
and ROSSI-PANELLA 1965 (A 62) 180
ANTONINI, CHIANCONE and BRUNORI 1967 (A 64) 180
ANTONINI, SCHUSTER, BRUNORI and
WYMAN 1965 (A 61) 180
ANTOS and SEVCIK 1971 (393) 76, 74
AOYAMA 1970 (A 272) 194
APPLEBY 1969 (A 66) 180
AQUINAS 1964 (A 729) 223
ARAI 1969 (A 466) 206
ARIN and WARNECK 1972 (A 151) 186
ARMSTRONG 1922 (109) 30, 29
ARNOTT, PETIT and CHABRIER 1964
(A 467) 206
ARONDEL, GAUBERTI and ROC'ET
1964 (A 650) 218
ARONOW, DENDINGER and ROKAW 1971
(311) 64, 63; (647) 114, 147
ARONOW, HARRIS, ISBELL, ROKAW and
IMPARATO 1972 (312) 64, 62;
(649) 114, 147
ARONOW, KAPLAN and JACOB 1938 (646)
114, 147
ARONOW and ROKAW 1971 (313) 64, 64;
(648) 114, 147
ARTURSON, GARBY, ROBERT and ZAAR
1972 (35) 17, 15; (142) 34, 34
ASAI and TORU 1969 (A 468) 206
ASORBE DOMINGUEZ 1969 (A 790) 229
ASMUSSEN and VINTHER-PAULSEN 1953
(272) 59, 57
ASMUSSEN and VINTHER-PAULSEN 1949
(394) 76, 75
ASTRUP 1964 (360) 72, 69
ASTRUP 1966A (361) 72, 69
ASTRUP 1966B (362) 72, 69
ASTRUP 1967 (363) 72, 70
ASTRUP 1969 (364) 72, 70
ASTRUP 1970 (A 67) 180
ASTRUP 1970 (365) 72, 70
ASTRUP 1972 (366) 72, 70
ASTRUP 1966 (367) 72, 66
ASTRUP 1967 (368) 70, 70
ASTRUP, KJELDSSEN and WANSTRUP 1970A
(369) 72, 70
ASTRUP, KJELDSSEN and WANSTRUP 1970B
(370) 72, 70

1005051297

- ASTRUP, KJELDSEN and SIGAARD-ANDERSEN 1971 (479) 91, 89
 ASTRUP, PAULI, KJELDSEN and PETERSEN 1968 (200) 46, 45
 ASTRUP, TROMME, OLSEN and KJELDSEN 1972 (563) 105, 103, 104
 AUBEAU, LEROY and CHAMPEIX 1965 (A 320) 197
 AYRES 1972 (652) 114, 149
 AYRES and BUEHLER 1970 (169) 40, 38
 AYRES, BUEHLER and ARMSTRONG 1964 (A 36) 200
 AYRES, CRISCITIELLO and GIANNELLI 1956 (A 4) 176
 AYRES, EVANS and BUCHLER 1972 (A 245) 192
 AYRES, GIANNELLI and ARMSTRONG 1965 (A 36) 17, 15; (143) 34, 33; (193) 44, 42
 AYRES, GIANNELLI and MUELLER 1970 (A 314) 64, 63; (650) 114, 148
 AYRES, MUELLER, GREGORY, GIANNELLI and PENNY 1969 (315) 64, 63; (651) 114, 148
 BACK 1959 (499) 94, 93
 BADAL 1964 (A 469) 206
 BADEN 1970 (616) 112, 111
 BAKER and TUMASONIS 1971 (A 582) 214
 BAKER and TUMASONIS 1972 (A 583) 214
 BAKER, FISHER, MASEMORE and SOPHER 1972 (A 273) 194
 BALBO, MARUCCI and RONCHI 1966 (37) 17, 13, 15; (144) 34, 33
 BANERJEE, DOUZOU and LOMBARD 1968 (A 68) 180
 BANKL and JELLINGER 1967 (564) 105, 102
 BANYAI 1970 (653) 115, 151
 BARACH, ECKMAN and MOLOMUT 1941 (66) 22, 20, 21
 BARBOSA and PETERS 1971 (A 584) 214
 BARIBAUD, YACOB, FAURE, MALINAS and CAU 1970 (565) 105, 103
 BARRETT, BENNETT and BUCKMASTER (A 321) 197
 BARRIOS, KOLL and MALORN 1969 (500) 94, 93
 BARTEK, GAUME and ROSTAMI 1970 (A 274) 194
 BARTH, 1970 (A 275) 194
 BARTHE, PARIS, DUCHEMIN and THOMAS 1953 (145) 34, 33; (38) 17, 14
 BARTHELEMY, PARC, MICHAUD and MATHE 1967 (A 791) 229
 BARTLETT 1968 (654) 115, 153
 BASMADZHIEVA, KURCHATOWA, DAVYDKOVA and TSWETANOV 1968 (A 688) 222
 BATES, CHRISTIE and VARVIS 1960 (A 362) 200
 BAUER 1965 (A 5) 176
 BAUMBERGER 1923 (110) 30, 29
 BAXTER and HOBBS 1967 (111) 30, 28
 BEAN 1968 (A 620) 216
 BEARD 1969 (1) 9, 6
 BEARD and GRANDSTAFF 1970 (480) 91, 88
 BEARD and WERTHEIM 1967 (501) 94, 93
 BEARON 1965 (A 470) 206
 BEAUDOING, GACHON, BUTIN and BOST 1969 (566) 105, 102
 BECK and SUTER 1938 (316) 64, 63
 BEDELL and OSTIGUY 1967 (A 363) 200
 BECKMANS 1967 (A 6) 176
 BENDEL and VANCE 1965 (A 364) 200
 BEGHE 1964 (A 730) 225
 BEHRMAN, FISHER and PATON 1971 (567) 105
 BELAISCH 1954 (A 731) 225
 BELLI and GUILLANO 1955 (67) 22, 20
 BELYAEV 1967 (a 546) 211
 BENDER, GOTHERT, MALORNEY and SEBBESSE 1971 (481) 91, 89
 BENESCH, GIBSON and BENESCH 1964 (A 69) 180
 BENESCH, MAEDAN and BENESCH 1972 (A 70) 180
 BENSON and GREENBERG 1969 (438) 83, 81
 BEREZIN and PUZARES 1969 (A 792) 229
 BERNHARD and FILLER 1968 (A 793) 229
 BERTIN, FRANCOIS, PEQUIGNOT and SOULAIRAC 1970 (A 651) 218
 BERTONE 1965 (A 471) 206
 BESZNYAK 1967 (A 794) 229
 BETHUILL and DELAHAYE-PLOUVIER 1967 (A 652) 218
 BETHLENFALVAY 1971a (395) 76, 74
 BETHLENFALVAY 1971b (396) 76, 74
 BETKE 1968 (A 72) 181
 BETKE and SHEPARD 1968 (A 71) 180
 BEUMER 1964 (A 365) 200
 BEUMER 1965 (A 366) 200
 BHATNAGAR 1970 (A 547) 211
 BROWN 1969 (39) 17, 15
 BIDE and COLLIER 1964 (A 73) 181
 BILCHIK, MULLER-BERGH and FRESHMAN 1971 (439) 83, 81
 BILS and ROMANOVSKY 1967 (207) 49, 48
 BIMONTE, PORTOLANO and TUFANO 1971 (A 795) 229
 BINET and BURSTEIN 1948 (333) 67, 66
 BINET and BETOURNE 1951 (273) 59, 57
 BINNENBRUCK, HAUSEN, RUNOW and WERHEIT 1970 (A 591) 214
 BIRNSTINGL, COLE and HAWKINS 1966 (371) 72, 69
 BIRNSTINGL, COLE and HAWKINS 1967 (398) 76, 75
 BIRNSINGL, BRINSON and CHAKRABARTI 1971 (397) 76, 74
 BJURE 1965 (A 367) 200
 BJURE and FALLSTROM 1963 (568) 105
 BJURE and NILSSON 1965 (A 7) 176
 BLACKMORE 1970 (399) 76
 BLACKMORE 1970 (A 8) 176
 BLACKMORE 1970 (A 165) 187
 BLANC, HUYNH and ESPAGNO 1967 (A 322) 197
 BLOOM 1972 (A 166) 187
 BLUMER 1970 (A 276) 194

1005051298

BOCCADORO and INGIULLA
1968 (A 277) 194
BOCCALETTI, NOFRINI, JOSI and MAGGIO
1966 (A 796) 229
BOECK 1958 (170) 40, 38
BOGDAN and JUCHAU 1970 (A 548) 211
BOKHOVEN and NIESSEN 1961 (112) 30, 28
BOLLINELLI, ROUCH, PUJOL, CARRIERE
and CARLES 1971 (A 368) 200
BONNET, GRATADOU, BONNET and LECIAK
1967 (A 472) 206
BOOZ 1969 (A 369) 200
BORBELY 1965 (A 732) 225
BORST 1967 (275) 59, 57
BOTTEAU and MOUSSION 1967 (A 323) 197
BOUHUYS, GEORG, JONSSON, LUNDIN and
LINDELL 1960 (A 370) 200
BOULETTEAU and MOTIN 1970 (A 733) 225
BOULEY, GODIN, ROUSSEL and GIRARD
1971 (A 585) 214
BOUR 1964 (A 654) 218
BOUR, GUY-GRAND, TUTIN and TAMINIAUX
1967 (A 473) 206
BOUR, GUY-GRAND, ROGER, TUTIN and DORF
1968 (599) 110, 108
BOUR, PASQUIER and BERTRAND-HARDY
1966 (A 734) 225
BOUR, TUTIN and PASQUIER 1967 (A 474) 206
BOVE and SIEBENBERG 1970 (A 278) 194
BOWDEN and WOODHALL 1964 (66) 22, 21;
(146) 34, 33
BOZEK, PAJOR and WASOWICZ 1965 (A 653) 218
BRAJA and TROMPEO 1964 (201) 46, 45
BRANDENBERGER 1967 (A 621) 216
BRANDON 1970 (A 735) 225
BRANDT 1965 (A 279) 194
BRAUSER, VERSMOLD and BUCHER 1968 (A 549)
211
BREITNECKER 1938 (429) 80, 79
BRETON, CAROFF, MARTIN, DEHOUE and
DEHOUE 1969 (430) 80, 79
BRETON, GARAT and DEROBERT 1969
(A 34)
BREU 1942 (230) 53, 51
BREU 1942 (274) 59, 57
BREU 1943 (231) 53, 51
BREWER, EATON, GROVER and WEIL
1971 (41) 17, 15
BREWER, EATON, WEIL and GROVER 1970
(40) 17, 15
BREWER 1937 (334) 67, 66
BREYSSSE, BOVEF and GABAY 1966 (A 9) 176
BREYSSSE and BOVEE 1969 (171) 33, 39
BRICE and ROESLER 1966 (A 280) 194
BRIDGE and CORN 1972 (113) 30, 28
BRIGATTI, PARIGI and VARETTO 1964 (A 689)
222
BROBERG and SMITH 1967 (A 586) 214
BRODY and COBURN 1969 (276) 59, 56;
(400) 76, 74
BRODY and COBURN 1970 (277) 59, 56
BRUNNER 1939 (232) 53, 52
BRUNORI 1966 (A 74) 181
BRUNORI, ANTONINI, WYMAN, TENTORI
VIVALDI and CARTA 1968 (A 75) 181
BRUNORI, BONAVENTURA, BONAVENTURA
and WYMAN 1972 (A 76) 181
BRUSADELLI, PALMA and DIPRETORO 1968
(A 797) 229
BUCHWALD 1969 (172) 40, 38, 39
BUCHWALD 1969 (A 10) 176
BUCKLEY and FEAR 1964 (A 690) 222
BULTERLIS 1965 (A 798) 229
BUNCHER 1969 (569) 105, 103
BURCK and PORTWICH 1964 (551) 101, 99
BURG and DOUGLASS 1969 (A 655) 218
BURGESS, GILLESPIE, GRAF and NADEL
1968 (A 371) 200
BURMEISTER, BARCKOW, HUMPERT, IBE
and LERCHE 1968 (A 736) 225
BURMEISTER and HEUHAS 1970 (A 737) 225
BURSTON 1969 (A 622) 216 (A 799) 229
BURVILL 1970 (623) 216
BYSTROM 1970 (281) 194
CACCURI 1955 (278)
CAILAR, SERRE, ROQUEFFEUIL, LEFEBVRE
and MALZAC 1968 (A 800) 229
CAIRNS and DENHARDT 1968 (A 587) 214
CALLIGARI 1968 (A 656) 218
CAMMA 1967 (655) 115, 154
CAMPBELL 1936 (208) 49, 48
CAMPBELL 1968 (A 282) 194
CANDURA and CRAVERIA 1964 (401) 76, 74
CANEPÀ, CAVALLO and MUZIO 1968
(A 372) 200
CAPELLARO 1964 (A 691) 222
CAPELLARO and BRAGUZZI 1964 (A 692)
222
CAPELLARO and GANDOLFO 1964 (233)
53, 52
CARDING 1968 (502) 94, 93
CARNOW 1971 (A 246) 192
CAROFF, DEHOUE and DEROBERT 1970
(279) 59, 57
CARUSO and BARNABA 1968 (A 738) 225
CASARETT 1971 (2) 9
CASCINI and GAZZERRO 1966 (A 693) 222
CASTELLINO 1955 (69) 22, 20
CASULA, NISSARDI, SANNA-RANDACCIO
and FRAU 1969 (373) 200
CASULA, NISSARDI, SANNA-RANDACCIO
and FRAU 1969 (A 374) 200
CAUGHEY 1970 (A 78) 181
CAUGHEY, ALBEN, MCCOY, BOYER,
CHARACHE and HATHAWAY 1969
(A 77) 181
CELEGIN, HANSSON and SUNDSTROM
1971 (A 324) 197
CENTI and ZAFFIRI 1971 (A 73) 225
CHANCE, ERECINSKA and WAGNER 1970
(A 550) 211
CHEAH 1970 (A 79) 181
CHERKAVSKI 1970 (A 657) 218
CHEVALIER, KRUMHOLZ and ROSS 1963
(280) 59, 56

1005051299

CHEVAMER, KRUMHOLZ and ROSS 1963 (280) 59, 56
 CHEVALIER, KRUMHOLZ and ROSS 1966 (191) 44, 43
 CHEW, HANSON and SLACK 1969 (801) 229
 CHICHET-GOSSET, CHASSON, OIRESSER, ARNAUD and DUBOULOZ 1967 (A 802) 229
 CHICHKALDO, BENEVELSKY and MINSKY 1966 (A 283) 194
 CHINET, MICHEL and HAAB 1971 (A 375) 201
 CHIODI, DILL, CONSOLAZIO and HORVATH 1941 (195) 44, 42
 CHOSY, GEE and RANKIN 1963 (196) 44, 43
 CHOVIN 1967 (173) 40, 38, 39
 CHRISTIANSEN and MAGID 1970 (A 80) 181
 CHUDZIKIEWICZ 1957 (335) 67, 66
 CHUKHRIENKO and LULKO 1968 (A 740) 225
 CINKOTAL and THOMSON 1966 (A 376) 201
 CIOCATTO and PATTONO 1964 (A 741) 225
 CIOCATTO, PATTONO, QUERCI and ZAFFIRI 1966 (A 803) 229
 CIS and PERANI 1964 (458) 86, 85
 CIUHANDU, DIACONOVICI, KISS and RUSU 1964 (325) 197
 CIUHANDU, DIACONOVICI, KISS and RUSU 1968 (377) 201
 CIUHANDU and RUSU 1968 (A 326) 197
 CIUHANDU, RUSU, DIACONOVICI and KISS 1966 (A 11) 176
 CLARK and BUCKINGHAM 1971 (A 327) 197
 CLAUZEL, TRINQUET, CARRE and MEYER 1966 (197) 44, 43
 CLAYTON 1969 (A 247) 192
 COBURN 1967 (A 206) 190
 COBURN 1970 (3) 9, 7= (A 154) 186
 COBURN 1970 (A 208) 190
 COBURN 1970 (A 209) 190
 COBURN, FORSTER and KANE 1965 (A 152) 186
 COBURN and MAYERS 1971 (617) 112
 COBURN, SWERDLOW, LUGMANMAKI, FORSTER and POWELL 1968 (A 153) 186
 COBURN, WALLACE and ABOUD 1971 (210) 190
 COBURN, WILLIAMS and KAHN 1966 (A 205) 190
 COBURN, WILLIAMS, WHITE and KAHN 1967 (A 207) 190
 COHEN, DEANE and GOLDSMITH 1969 (317) 64, 61
 COHEN, DORION, GOLDSMITH and PERMUTT 1971 (174) 40, 38, 39
 COHEN, PERKINS, URY and GOLDSMITH 1971 (70) 22, 19
 COLE, HAWKINS and ROBERTS 1972 (570) 105, 104
 COLLINS and GOULDING 1971 (A 742) 225
 COLLISON, RODKEY and O'NEAL 1968 (A 12) 176
 COLTMAN and DUDLEY 1969 (A 212) 190
 COLTMAN, DUDLEY and LEVERETT 1969 (211) 190
 COMMINS and LAWTHOR 1965 (A 13) 176
 COMSTOCK, SHAH, MAYER and ABBEY 1971 (571) 105, 102
 CONKLE, MABSON, ADAMS, ZEFT and WELCH 1967 (A 167) 187
 CONNEY, LEVIN, IKEDA and KUNTZMAN 1968 (A 551) 211
 CONROY 1969 (656) 115, 155
 COOPER 1966 (4) 9, 8
 COOPER, SCHLEYER and ROSENTHAL 1970 (A 552) 211
 CORET and HUGHES 1964 (336) 67, 66
 COSBY and BERGERON 1963 (234) 53, 52
 COSCIA, PERRELLI, GAIDO and CAPELLARO 1964 (402) 76, 74
 COSIC, ARSENIJEVIC, KANDIC and GRBESA 1964 (A 694)
 COTES, DABBS, EVANS and HOLLAND 1972 (A 378) 201
 CRAMOND 1968 (A 475) 206
 CROSETTI, PETTINATI and RUBINO 1965 (A 658) 218
 CROSETTI, RUBINO and PETTINATI 1966 (71) 22, 20; (A 81) 181
 CUCHE and BERNARD 1969 (A 659) 218
 CULVERWELL 1915 (114) 30, 27
 CURPHEY, HOOD and PERKINS 1965 (42) 17, 13, 15; (147) 34, 33
 CURPHEY 1968 (657) 115, 156
 DAHMSTROM, NORDSTROM-OHRBERG and ROTHCHILD 1958 (43) 17, 14; (148) 34, 33
 DALGAARD 1965 (A 660) 218
 DALHAMN, EDFORD and RYLANDER 1968 (11t) 30, 28
 DALLE, TOURNAIRE, BRUDIEUX and DELOST 1971 (A 381) 201
 DALY 1969 (A 380) 201
 DALY and WALDHIAUSEN 1967 (A 379) 201
 DAMIA, SIBILLA and DAMIA 1965 (A 743) 225
 D'AMORE, GIORDANO and PENATI 1968 (A 476) 206
 DANTO 1964 (618) 112, 111
 D'ARCA, GUALDI and ARCIERI 1964 (202) 46, 45
 DATSENKO 1964 (A 588) 214
 DATSENKO 1965 (A 14) 176
 DATSENKO 1965 (A 695) 222
 DATSENKO 1966 (235) 53, 52
 DATSENKO, DOTSENKO, MARTYNIUK and PALCHEVSKY 1965 (A 553) 211
 DATSENKO, DOTSENKO 1967 (A 554) 211
 DAVID 1971 (624) 216
 DAVIES, JONES and WARNER 1965 (A 328) 197
 DEANE, GOLDSMITH and TUMA 1965 (A 696) 222

1005051300

DeBIAS, BIRKHEAD, BANERJEE, KAZAL,
HOLBURN, GREENE, HARPER, ROSENFELD
MENDUKE, WILLIAMS and FRIEDMAN
1972 (318) 64, 62

DeBRUIN 1967 (175) 40, 38

DeBRUIN and HAERINGEN 1965 (176)
40, 38, 39

DeBRUIN, VROEGE and VAN HAERINGEN
1965 (177) 40, 38

DEEN 1969 (804) 230

DeGRAFF, TAYLOR, ORD, CHUANG and
JOHNSON 1965 (A 382) 201

DELIVORIA-PAPADOPOULOS and COBURN
1972 (572) 105, 102

DELWICHE 1970 (A 188) 189

DEMANGE and AUZAS 1969 (482) 91, 90

DESBAUMES 1968 (A 698) 222

DESOILLE 1967 (178) 40, 38

DESOILLE, CASTILLON, du PERRON, CREMER
and LEBBE 1963 (A 213) 190

DESOILLE, CREMER and GIRARD 1965
(A 214) 190

DETTORI and SCANSETTI 1965 (A 699) 222

DeVALOIS and SCHADE 1967 (529) 97, 96

DEVIATKA 1956 (337) 67, 66

DIAMANT-BERGER, GAJDOS, RAPIN and
GOULON 1970 (281) 59, 56

DILLE and MOHLER 1969 (A 168) 187

DIMIZIC, FELICI and BIETTI 1969 (A 477) 206;
(A 661) 218

DINMAN 1968 (5) 9, 7

DINMAN 1969 (319) 64, 61

DINMAN 1970 (658) 115, 160

DINMAN, EATON and BREWER 1970 (A 82)
181

DIXON 1927a (116) 30, 27

DIXON 1927b (117) 30, 27

DOBOSZ and LUCZYWEK 1971 (A 478) 206

DOMINGUEZ, HALSTEAD and DOMANSKI
1964 (A 15) 176

DONATELLI 1940 (236) 53, 52

DONTENWILL 1967 (210) 49, 48

DONTENWILL 1970 (211) 49, 48

DONTENWILL, RECKZEH and STADLER
1966 (72) 22, 20; (209) 49, 48

DONTENWILL, RECKZEH and STADLER 1967
(73) 22, 20

DORSCH and KOSTER 1965 (a 16) 176

DOUGLAS 1967 (A 189) 189

DOUMER and MERLEN 1946 (237) 53, 52

DOUZE 1971 (A 662) 218

DOUZE, HEYST, KREUKNIET, LEEUW and
HAMELINK 1967 (A 663) 219

DOYLE 1969 (659) 115, 162

DRABKIN 1970 (A 215) 190

DRISCOLL, DEUBER, BAETTIG and
GRANDJEAN 1972 (74) 22, 20

DROGICHIINA and RYZHIKOVA 1967 (A 479)
207

DUBLIN 1972 (94) 26, 25

DUBOIS 1970 (6) 9, 7

DUBOIS and MONKMAN 1972 (A 330) 197

DUBOIS, ZDROJEWSKI and MONKMAN

1966 (A 329) 197

DuCAILLAR, LEFEBVRE, ROQUEFEUIL, MALZAC
and PROST 1970 (A 805) 230

DUCROS 1968 (A 331) 197

DUGNAT 1965 (503) 94, 93

DUKE, GREEN and NEIL 1952 (212) 49, 47

DUKE and KILLICK 1952 (213) 49, 47

DUNLAP 1961 (A 284) 194

DUPLAY, ZIEGLER, GARDO and PINTO 1967
(403) 76, 74

DVORAK, PROKSAN and ZITKA 1951 (238) 53, 52

EBERSOLD 1958 (A 169) 187

ECKARDT, MacFARLAND, ALARIE and

BUSEY 1972 (214) 49, 48

EFFENBERGER 1967 (A 17) 176

EHRICH, BELLET and LEWEY 1944 (239)
53, 52

EHRISMANN and ABEL 1934 (118) 30, 29

EISEN and HAMMOND 1956 (404) 76, 75

EISENBUD and EHRLICH 1972 (A 248) 192

EL-ATTAR 1968A (405) 76, 74

EL-ATTAR 1968B (406) 76, 74

EL-EBRASHY, EL-ASHMAWY and ALY
1967 (407) 76, 74

ELFIMOVA and KHUCHIATURYAN 1968
(A 249) 192

ELIOT and BRA TT 1969 (408) 77, 75

ELLIS and SEATONBERRY 1966 (A 170) 187

ENGEL, RODKEY, O'NEAL and COLLISON
1969 (A 83) 181

ENGEL, RODKEY and KRILL 1971 (A 18)
177

ENVIRONMENTAL HEALTH SERVICE 1970
(7) 9, 7

ENVIRONMENTAL PROTECTION AGENCY
1971 (A 250) 192

EPSTEIN 1969 (A 251) 192

ERBEN 1967 (A 19) 177

ESTABROOK, FRANKLIN and HILDEBRANDT
1970 (A 555) 211

ESTLER 1965 (A 744) 226

ESTLER, AMMON and HEIM 1971A (605)
94, 93

ESTLER, AMMON and ZIMMERMANN
1969 (504) 94, 93

ESTLER, HEIM, AMMON and ZIMMERMANN
1971B (506) 94, 93

FABRE, TRUIAUT and BERROD 1951
(75) 22, 21

FAIVRE, DUREAX, VINCENT and MULLER
1954 (240) 53, 52

FAIVRE, GILGENKRANTZ and HUEBER 1959
(241) 53, 52

FALCONER and MOLLER 1971 (A 20) 177

FALLSTROM 1968 (A 218) 190

FALLSTROM 1968 (A 219) 190

FALLSTROM 1969 (A 220) 190

FALLSTROM and BJURE 1967 (A 216) 190

FALLSTROM and BJURE 1968 (A 217) 190

FARBEROW and SIMON 1969 (A 625) 216

FATINI and GALLENGA 1968 (A 626) 216

1005051301

FAIRE, VINCENT, ESCHAPASSE, CASTAING,
LOISEAU and CHEVAIS 1965 (530) 97, 96
FAURE, VINCENT, ESCHAPASSE, LOISEAU
and CASTAING 1965 (A 480) 207
FAZEKAS 1967 (507) 94
FELDMAN and LAMPERT 1968 (A 664) 219
FELDSTEIN 1965 (A 21) 177
FELDSTEIN 1965 (A 332) 197
FELDSTEIN 1967 (A333) 198
FELDSTEIN 1969 (A 252) 192
FENN 1970 (A 155) 186
FENN 1971 (A22) 177
FIANDACA and VERCELLOTTI 1964 (179)
40, 37
FINCK 1966 (8) 9, 6
FIRST and MURPHY 1970 (A 700) 222
FISHER, HYDE, BAUE, REIF and KELLY 1969
(198) 44, 42; (215) 49, 48
FISHER 1968 (A 665) 219
FLAXMAN 1939 (282) 59, 56
FLEIG 1908 (A 589) 214
FLETCHER 1972 (A 383) 201
FODOR 1969 (431) 80, 79
FODOR, MALORNY and COLMANT 1964
(531) 97, 96
FORBES 1970 (A 385) 201
FORBES, SARGENT and ROUGHTON 1945
(A 384) 201
FORMAN and FEIGELSON 1971 (A 84) 181
FORSTER 1970 (A 156) 186
FORSTER, ROUGHTON, CANDER, BRISCOE
and KREUZER 1957 (A 386) 201
FORTUNATO and CATALANO 1970 (459) 86, 85
FOURNIER 1967 (A 745) 226
FRANCHINI, CANALE and CELESTRI
1967 (A 23) 177
FRANCISCO and SILVEY 1971 (A 590) 214
FRANCOIS and BERTIN 1964 (A 627) 216
FREIGANG, SEIDEL and FLACH 1968 (460)
86, 85
FREIREICH and LANDAU 1971 (A 24) 177
FREYSSCHUSS and HOLMGREN 1965 (A 387)
201
FRIBERG, NYSTROM and SWANBERG 1959
(573) 105, 102
FRITSCH 1969 (461) 86, 85
FRONING, MATHER, DADDARIO and
HARTUNG 1969 (A 592) 214
FRYZE, GRUSZKA and ZAWADZKI 1970 (A 666)
219
FUKUI and KAKIUCHI 1970 (A 85) 181
GABRIEL 1969 (A 388) 201
GAENSLE, CADICAN, ELLICOTT, JONES
and MARKS 1957 (44) 17, 14; (149) 34, 33
GARLAND and PEARCE 1967 (A 481) 207
GARREL, PERRET, PELLAT and ARNOULD
1970 (A 483) 207
GARREL, PERRET, PELLAT and ARNOULD
1970 (A 482) 207
GASSMAN and WHANNE 1967 (A 25) 177
GATTO, CANEPA, CAVALLO and MASSIMILIA
1967 (A 389) 201

GAULTIER, FOURNIER, GERVAIS and
BODIN 1964 (A 484) 207
GAULTIER, FOURNIER, GERVAIS,
EFTHYMIU, SRAER, DISMUTH,
BODIN, CHRISTOFOROV, SICOT and
FREJAVILLE 1968 (A 746) 226
GAULTIER, FREJAVILLE, BISMUTH and
PEBAY-PEYROULA 1970 (A 628) 216
GAUME, BARTEK and ROSTAMI 1971 (508)
94, 93
GEDDES and STEINHARDT 1968 (A 86)
181
GEIER, TUTTIN, PASQUIER, NAJMAN
and BOUR 1966 (532) 97, 96
GEMZELL, ROBBE and STROM 1958
(574) 105, 102
GEORGE and SCHEJTER 1964 (A 87) 181
GERBER and SEEWALD 1966 (A 747) 226
GERHARDT, GOTHERT, MALORNY and
WILKE 1970 (A 390) 201
GERHARDT, GOTHERT, MALORNY and
WILKE 1971 (A 806) 230
GERITSEN 1964 (A 701) 222
GETTLER and MATTICE 1933 (45) 17
11, 14
GIBBONS and MITROPOULOS 1972 (372)
72, 70
GIBSON, HELLER and YAKULIS 1966
(A 89) 181
GIBSON and KAMEN 1966 (A 90) 181
GIBSON, PALMER and WHARTON 1965
(A 88) 181
GIBSON and PARKHURST 1968 (A 91) 182
GIEL 1965 (660) 115, 163
GIEVER 1967 (9) 9, 6
GIEVER and RUCH 1971 (A2 53) 192
GILL 1971 (A 667) 219
GIRARDI, CIS and PLATTI 1967 (A 485) 207
GIROUD 1967 (575) 105, 102
GLADYSHEVSKAIA, DOLOSHITSKY and
SOBCHUK 1966 (619) 112, 111
GLASEL 1970 (A 748) 226
GLASS, MALLACH and WOJAHN 1966
(A668) 219
GLASS, EDWARDS, DeGARRETA and
CLARK 1969 (A 92) 182
GLASS, GARRETA, LEWIS, GRAMMATICOS
and SZUR 1968 (409) 77, 74
GLASS, JACOBY, WESTERMAN, CLARK,
ARNOT and DIXON 1968 (576) 105, 102
GLOWACKI, GRUDZINSKA and WACLAWIK 1958
(432) 80, 79
GOKIN 1971 (283) 59, 57
GOLACKA, JANIK-KURYLCIO and
ROZEK 1969 (A 669) 219
GOLDBERG and CHAPPELL 1967 (509) 94, 93
GOLDSMITH 1964 (10) 9, 6
GOLDSMITH 1967 (A 254) 192
GOLDSMITH 1967 (A 670) 219
GOLDSMITH 1969 (661) 115, 164
GOLDSMITH 1970 (320) 64, 61
GOLDSMITH 1972 (662) 115, 165

1005051302

- GOLDSMITH and COHEN 1969 (11) 9, 7
 GOLDSMITH and DEANE 1965 (A 286) 194
 GOLDSMITH and LANDAW 1968 (12) 9, 6
 GOLDSMITH and ROGERS 1959 (285) 194
 GOLDSMITH, SCHUETTE and NOVICK 1963
 (46) 17, 13, 14; (150) 34, 33
 GOLDSMITH and TERZAGHI 1963 (76) 22, 21;
 (151) 34, 33
 GOLDSMITH, TERZAGHI and HACKNEY 1963
 (180) 40, 38
 GOLDSTEIN 1965 (577) 105, 102
 GOLDSTEIN and EPSTEIN 1972 (663) 115, 166
 GORALSKI and JANUSZKO 1968 (A 486) 207
 GORDON 1965 (A 487) 207
 GORODINSKY, LEVINSKY and SCHERBAKOV
 1967 (A 334) 198
 GORSKI 1962 (284) 57, 59
 GOTHE, FRISTEDT, SUNDELL, KOLMODIN
 EHKNER-SAMUEL and GOTHE 1969
 (181) 40, 38, 39
 GOTHERT, LUTZ and MALORNY 1970 (338)
 67, 66
 GOTO 1968 (A 749) 226
 GOULDING 1965 (A 629) 216
 GOULDING 1967 (A 750) 226
 GOULON, BAROIS, RAPIN, NOUAILHAT,
 AUGUSTIN, HENNETIER, BAGUET,
 KUNTZIGER and BRETEAU 1965 (A 751) 226
 GOULON, BAROIS, RAPIN, NOUAILHAT,
 GROSBUIS and LARROUSSE 1969 (A 809) 230
 GOULON, BAROIS, GAJDOS, LABROUSSE,
 SCHORTGEN, AMERONGEN and ROBERT
 1970 (A 752) 226
 GOULON and HENNETIER 1966 (A 807) 230
 GOULON, LEVY-ALCOVER, NOUAILHAT
 and DORDAIN 1967 (A 808) 230
 GOULON, LEVY-ALCOVER, NOUAILHAT and
 DORDAIN 1968 (A 810) 230
 GRAHAM and HITCHENS 1968 (A 630) 216
 GRAMER and BECKENKAMP 1966 (A 811) 230
 GRAMER and ROUF 1968 (410) 77, 74
 GRAZIANI and PAGGI 1965 (A 812) 230
 GRAZIANI, ROSSI, CASTELLINO and
 SILVERSTRON 1957 (243) 53, 52
 GRAY and GIBSON 1970 (A 93) 182
 GRAY and GIBSON 1971 (A 94) 182
 GRAY and GIBSON 1971 (A 95) 182
 GRAYBIEL 1942 (242) 53, 51
 GREGORY, MALINOSKI and SHARP 1969
 (A 631) 216
 GREMY, SALMON, FRANCOIS and BERTIN
 1968 (A 671) 219
 GRIFFIN and HOLLOCHER 1967 (A 96) 182
 GRIFFITHS 1970 (A 672) 219
 GROB 1968 (119) 30, 29
 GROHME, SCHNEIDER and MASSHOFF 1969
 (533) 97, 96; (A 488) 207
 GROSSE and NEUHAUS 1970 (552) 101, 99
 GRUNDY 1969 (A 255) 192
 GRUT, ASTRUP, CHALLEN and GERHARDSSON
 1970 (13) 9, 7
 GUELIN 1969 (A 702) 223
 GUEST, DUNCAN and LAWTHIER 1970
 (462) 86, 85
 GUEYE, BA and DIOP 1965 (A 673)
 219
 GUIDOTTI and KONIGSBERG 1964 (A 97) 182
 GUILLERM, BADRE and GAUTIER 1967
 (285) 59, 56
 GULERIA, PANDE, SEITHI and ROY 1971
 (A 391) 201
 GULZOW 1957 (A 392) 201
 GUNTHER 1971 (A 489) 207
 GUTENKAUF, BRATT and ELIOT 1967
 77, 75
 GUY, SALHANY and ELIOT 1971 (412)
 77, 75
 GUYATT, NEWMAN, CINKOTAL, PALMER
 and THOMSON 1965 (A 393) 202
 GYDELL 1966 (A 26) 177
 HAAB and PIPER 1968 (A 394) 202
 HAAGEN-SMIT 1966 (A 287) 194
 HADDON, NESBITT and GARCIA 1961
 (578) 105, 104
 HAEBISCH 1970 (120) 30, 28
 HAGGARD and GREENBERG 1934 (601) 110,
 109
 HAHN and COPELAND 1966 (A 593) 214
 HAKIM 1970 (580) 106, 102
 HALL 1970 (463) 86, 85
 HALL 1972 (433) 80, 79
 HALPERIN, McFARLAND, NIVEN and
 ROUGHTON 1959 (440) 83, 81
 HAMEL-PUSKARIC, BERITIC, JUSIC and
 FRANJIC 1970 (A 490) 207
 HAMILL and O'NEILL 1969 (77) 22, 21
 HAMILTON and KERSTING 1970 (A 395)
 202
 HAMM 1966 (A 396) 202
 HANISCH 1969 (A 98) 182
 HANKE and KIERES 1967 (602) 110, 108
 HANKS 1970 (483) 91, 89
 HANQUET and LAMY 1971 (A 813) 230
 HANSEN 1970 (A 491) 207
 HANSEN, WILKE, MALORNY and GOTHERT
 1972 (47) 17, 15; (153) 34
 HANSON and HASTINGS 1933 (78) 22,
 34, 33
 HANSSON and SUNDSTROM 1969 (A 27)
 177
 HANSZ and STYPEREK 1968 (464) 86, 85
 HARADA and KOZUMA 1968 (534) 97, 96
 (A 492) 207
 HARADA, TSUKAYAMA, MIMURA, MINAMI
 and TATETSU 1971 (535) 97, 96
 HARDING, WONG and NELSON 1964
 (603) 110, 108
 HARKE 1970 (95) 26, 24, 25
 HARKE 1971 (100) 26, 25
 HARKE and DREWS 1968 (121) 30, 29
 HARTRIDGE 1920 (48) 17, 11, 14
 HATZFELD, WIENER and BRISCOE 1967
 (A 397) 202
 HAYASINI, MOTOKAWA and KIKUCHI
 1966 (A 99) 182

1005051303

- HAYES and HALL 1964 (244) 54, 52
 HAYWOOD, WALBERG, KERR, MOHSEININ
 and MOHLER 1972 (321) 64, 61
 HEGGLIN 1944 (245) 54, 52
 HEIDRICH, BARCKOW and FRISIUS 1970 (339)
 67, 66
 HEIDRICH and KLEMS 1969 (373) 72, 69
 HEISTAD and WHEELER 1972 (340) 67, 66
 HELLUNG-LARSEN, KJELDSSEN, MELLEMGAARD
 AND ASTRUP 1966 (A 28) 177
 HELLUNG-LARSEN, LAURSEN, KJELDSSEN and
 ASTRUP 1968 (374) 72, 70
 HELMCHEN and KUNKEL 1964 (441) 83, 81
 HERNANDEZ, MAZEL and GILLETTE 1967
 (A 556) 211
 HERON 1962 (581) 106, 102, 104
 HESS 1971 (101) 26, 25
 HEXTER and GOLDSMITH 1971 (A 256) 192
 HEYDENREICH 1970 (442) 83, 81
 HEYNDRIKX, SCHEIRIS, VERCRUYSE and
 OKKERSE 1970 (A 753) 226
 HILDEBRANDT, FRANKLIN, ROOTS and
 ESTABROOK 1971 (A 100) 182
 HILPERT 1971 (A 398) 202
 HIRANO, INOUE and TANAMI 1967 (604)
 110, 109
 HIRANO, INOUE and TANAMI 1968 (605)
 110, 108
 HIRANO, INOUE and TANAMI 1971 (A 814)
 230
 HIRATA, HIOKI and HASHIMOTO 1969 (510)
 94, 93
 HIRSCH 1968 (A 594) 214
 HLAVICA, KIESE, LANGE and MOR 1969
 (A 557) 211
 HOCHSTRATE and OBERDISSE 1970 (A 558)
 211
 HODY and BAILEY 1968 (A 171) 187
 HOFREUTER, CATCOTT and XINTARAS
 1962 (49) 17, 15; (154) 34, 33
 HOLCZABEK 1971 (286) 59, 58
 HOLETON 1971 (A 595) 214
 HOLETON 1971 (A 596) 214
 HOLLAND 1965 (A 101) 182
 HOLLAND 1967 (A 102) 182
 HOLLAND 1969 (A 104) 182
 HOLLAND 1969 (A 103) 182
 HOLLAND 1970 (A 105) 182
 HOLM 1950 (287) 59, 57
 HOLMGREN 1965 (A 402) 202
 HOLMGREN 1965 (A 399) 202
 HOLMGREN 1965 (A 400) 202
 HOLMGREN 1965 (A 401) 202
 HORIE 1964 (A 106) 182
 HORIE 1965 (A 107) 182
 HORVATH, DAHMS and O'HANLON 1971
 (484) 91, 89
 HOSKO 1970 (443) 83, 81
 HOWSE and SEDDON 1966 (620) 112, 111
 HSIEH, ROSS, SMALL and THOMPSON 1968
 (A 403) 202
 HSI-PU and LI-MING 1910 (79) 22, 21
 HUBER, EPP and FORMANEK 1970
 (A 108) 182
 HUBERT 1943 (322) 64, 63
 HUEPER 1944 (375) 72, 70
 HUGHES and FISHER 1965 (A 674) 219
 HUNDT and GRUNBERG 1960 (246)
 54, 52
 HYDE, MARIN, RYNE, KARREMAN
 1971 (A 404) 202
 IABLOCHKIN 1966 (A 335) 198
 ICHIKAWA, HAGIHARA and YAMANO
 1967 (A 559) 211
 IKEDA 1969 (444) 83, 81
 IKUTA 1969 (A 494) 207
 INANAGA 1966 (A 497) 208
 INANAGA 1968 (A 498) 208
 INANAGA, KUHARA, KUWAHARA,
 TORISU and SUZUKI 1966A (536)
 97, 96
 INANAGA, KUHARA, KUWAHARA and
 OGATA 1966B (537) 97, 96
 INGIULLA, GRASSO and MARIOTTINI
 1968 (A 288) 194
 IPPEN and GOERZ 1969 (621) 112, 111
 ISHIKAWA 1969 (A 499) 208
 IWANOWSKA 1967 (A 815) 230
 JACOBSEN 1971 (A 816) 230
 JAFFE 1968 (A 190) 189
 JAFFE 1970 (A 191) 189
 JAFFE 1965 (288) 59, 57
 JAFFE 1968 (323) 64, 61
 JAGI and ZIMMERMANN 1934 (289)
 59, 56
 JAMES and RUMBLE 1967 (A 405) 202
 JARRELL 1965 (122) 30, 28
 JAVANOVIC and POLOVINA 1964 (A 29)
 177
 JECH 1972 (14) 9, 6
 JEDRYCHOWSKI, KUS, PIOTROWSKI
 and SAWICKI 1965 (A 560) 212
 JEDRYCHOWSKI, KUS, PIOTROWSKI and
 SAWICKI 1965 (A 561) 212
 JEFFCOATE and GAYLOR 1969 (A 109) 182
 JENEY and MEDVE 1967 (A 597) 214
 JESCHECK 1967 (A 500) 208
 JOELS and NEIL 1962 (216) 49, 47
 JOHNSON, DWORETZKY and HELLER 1968
 (A 289) 195
 JOHNSON and MILLER 1968 (A 408) 202
 JOHNSON, TAYLOR and De GRAFF 1965
 (A 407) 202
 JOHNSON, TAYLOR and LAWSON 1965
 (A 406) 202
 JOHNSTON and BURGER 1971 (A 172) 187
 JONES, YANT and BERGER 1923 (102) 26, 24
 JONES, STRICKLAND, STUNKARD and
 SIEGEL 1971 (413) 77, 75
 JONGBLOED 1939 (80) 22, 19
 JOPKIEWICZ, KONECKI and WENTKOWSKI
 1965 (622) 112, 111
 JORDI 1967 (A 501) 208
 JORDI 1968 (A 703) 223
 JUDD 1971 (A 173) 187

1005051304

- JUNGE, SEILER, BROCK, GREASE and
RADLER 1971 (a 192) 189
- KALIAEVA 1951 (290) 60, 56
- KAMATAKI and KITAGAWA 1971 (A 562) 212
- KAMPFFMEYER and KIESE 1965 (A 563) 212
- KAMRAJ-MAZURKIEWICZ 1967 (581) 106, 102
- KANAZIRSKY 1965 (A 409) 202
- KARACAN, BARNARD and WILLIAMS 1971
(538) 97, 96
- KASHIMA, FUKUI, MASUDA, WAKASUGI and
HAYAMA 1969 (675) 219
- KATSUKI 1965 (A 502) 208
- KATSUKI 1966 (606) 110, 108
- KATSURA 1971 (445) 83, 82
- KATZSCHMANN 1970 (291) 60, 56
- KAWAMOTO 1966 (A 410) 202
- KAWAMURA 1971 (465) 86, 85
- KAYES 1965 (14a) 8, 6
- KAYES 1970 (A 632) 216
- KAYSER 1939 (341) 67, 66
- KEHL and KEHL 1967 (A 503) 208
- KEITH and TESH 1965 (123) 30, 29
- KELLS 1968 (582) 106, 102
- KEMKES 1941 (A 704) 223
- KENT 1970 (A 174) 187
- KERTESZ, ANTONINI, BRUNORI, WYMAN and
ZITO 1965 (A 175) 187
- KEYES, MIZUKAMI and LUMRY 1967 (A 110)
83
- KHACHATURYAN, MITAREVSKAYA and
EGORENKOVA 1969 (511) 94, 93
- KHROLENKO 1969 (A 504) 208
- KILLICK 1940 (15) 9, 6
- KILLICK and MARCHANT 1965 (A 754) 226
- KIM and PARK 1968 (A 633) 216
- KIM and RYO 1966 (A 336) 198
- KIRIACHKO 1966 (217) 49, 48
- KITTEL and THEISSING-ERLANGEN 1968
(466) 86, 85
- KITTREDGE 1971 (A 676) 219
- KJELDSSEN 1969 (376) 73, 69
- KJELDSSEN 1970a (377) 73, 70
- KJELDSSEN 1970b (378) 73, 70
- KJELDSSEN, ASTRUP and WANSTRUP 1972
(379) 73, 70
- KJELDSSEN and DAMGAARD 1968 (380) 73, 70
- KJELDSSEN and DAMGAARD 1968 (414) 77, 74
- KJELDSSEN and MOZES 1969 (381) 73, 69
- KLAUSEN, RASMUSSEN, GJELLEROD, MADSEN
and PETERSEN 1968 (203) 46, 45,
(292) 60, 56
- KLAUIS and SCHULZ 1966 (293) 60, 57
- KLEDECKI and WINIARSKI 1963 (247) 54, 52
- KLINGENMAIER, BEHAR and SMITH 1969
(A 30) 177
- KLINGHOFFER 1965 (A 677) 219
- KOBUTNICKY 1966 (553) 101, 99
- KOCII 1965 (A 31) 177
- KOELSCH 1936 (294) 60, 57
- KOHN-ARREST 1949 (124) 30, 29
- KOKAME and SIHLER 1968 (A 817) 230
- KOJLB 1968 (623) 112, 111
- KOJLB 1968 (624) 112, 111; (A 505) 208
- KOMURA 1967 (539) 97, 96
- KONDRASHENKO, GLANTS and MAEROVICH
1971 (A 818) 230
- KORNER 1965 (218) 49, 47
- KOSMIDER, ZURKOWSKI and WEGIEL 1965
(A 111) 183
- KOSTLER, OTTO, RITTIG and POLSTER
1967 (A 32) 177
- KOSTYUKOVA 1951 (248) 54, 52
- KOTTER, HUCH, STOTZ and PIPER 1969
(A 411) 203
- KRAL, CERNOCHOVA and TUSL 1966
(A 412) 203
- KRATOCHVIL, WILKS and GERRARD 1957
(485) 91, 89
- KRATZ 1968 (A 564) 212
- KRETZER 1964 (A 697) 222
- KREUKNIET 1964 (A 413) 203
- KREUZER and CAMPAGNE 1965 (413a) 203
- KRISHMAN, KUPPUSWAMY, MANI and MAJID
1971 (A 678) 219
- KROBER, LANGE, MATHIES and MOR
1968 (A 565) 212
- KROBER, LANGE, MATHES and MOR
1970 (A 566) 212
- KROETZ 1936 (295) 60, 56
- KROETZ 1936a (324) 64, 63
- KROETZ 1936b (325) 64, 63
- KRUG 1965 (A 506) 208
- KRUSMANN, SCHRODER and SCHRODER
1971 (A 33) 177
- KRUSZYNSKI and HENRIKSEN 1969 (125)
30, 28
- KUCHER and RIEDEL 1969 (A 819) 230
- KUNZ, DONDES and HARTECK 1970 (A 337)
198
- KUNTZMAN, LEVIN, JACOBSON and
CONNEY 1968 (A 567) 212
- KUPFER and WUNSCHER 1968 (512) 94, 93
- KUROIWA 1967 (A 679) 219
- KUROIWA, MURAO, HARUMI, KATAYAMA,
YAMAMOTO, CHEN and UEDA
1968 (249) 54, 52
- KUROIWA, KATO and UMEZAKI 1968
(540) 97, 96
- KUROIWA, SHIDA and KATO 1969 (A 507)
208
- KUROIWA, SHIDA, NAGAMATSU, KATO and
SANTA T 1967 (446) 83, 81
- KUTTNER 1968 (467) 86, 85
- LACHNIT 1964 (A 634) 216
- LACOSTE 1971 (A 415) 203
- LACOSTE and ROUCH 1966 (A 414) 203
- LAMY and HANQUET 1968 (A 820) 230
- LAMY and HANQUET 1969 (A 821) 231
- LAMY and NOIRFALISE 1971 (A 680) 219
- LANDAU, SMITH and LYNN 1969 (A 290)
195
- LANDAW 1969 (A 222) 190
- LANDAW 1970 (A 223) 191
- LANDAW, CALLAHAN and SCHMID 1970
(A 112) 183

- LANDAW and WINCHELL 1966 (A 221) 190
 LANDAW and WINCHELL 1970 (A 224) 191
 LANG, SCHUSTER, UNGERN-STERBERG, HAUM
 and KNOLLE 1969 (250) 54, 52
 LANGAUER-LEWICKA 1966 (A 508) 208
 LANGE, KASTNER and JUNG 1970 (A 568) 212
 LANGMANN 1964 (A 257) 192
 LANGMANN and KETTNER 1968 (A 291) 195
 LAPRESLE and FARDEAU 1966 (A 509) 208
 LAPRESLE and FARDEAU 1967 (A 510) 208
 LAPRLE and FARDEAU 1971 (A 511) 208
 LARCAN, LANDES and VERT 1970 (583)
 106
 LARCAN, ROBERT, CALAMAI and FREJAVILLE
 1967 (A 822) 231
 LARSON, HAAG and SILVETTE 1961 (16)
 9, 7
 LARSON and SILVETTE 1968 (17) 9, 7
 LARSON and SILVETTE 1971 (18) 9, 7
 LATALSKI and PAWLOWSKA 1969 (A 569) 212
 LATALSKI and PAWLOWSKA 1970 (A 570) 212
 LAVERNE 1970 (486) 91, 88
 LAVERNE 1970 (A 755) 226
 LAWSON 1970 (A 416) 203
 LAWSON 1971 (A 113) 183
 LAWSON 1972 (A 417) 203
 LAWTHER and COMMINS 1970 (18a) 9, 7;
 (155) 34, 33
 LEAVELL and McINTYRE 1969 (625) 112, 111
 LEBRETON and GARAT 1964 (A 292) 195
 LeBRETON and GARAT 1964 (A 681) 219
 LeBRETON and GARAT 1964 (A 682) 220
 LECLERQ 1970 (19) 10, 6
 LEDINGHAM 1964 (A 823) 231
 LEE 1966 (A 824) 231
 LEE and SCHRAUZER 1968 (A 598) 214
 LEE 1908 (126) 30, 29
 LEHMANN 1968 (A 35) 178
 LEHMANN 1908 (127) 30, 27
 LEHMANN 1909 (128) 30, 28
 LEHR 1970 (A 683) 220
 LEONOWICZ 1967 (554) 101, 99
 LEUCHTENBERGER, LEUCHTENBERGER and
 WEISS 1965 (81) 22, 20
 LEVIN 1965 (A 756) 226
 LEVIN, ALVARES and KUNTZMAN 1970 (A 114)
 183
 LEVIN and KUNTZMAN 1969 (A 572) 212
 LEVIN and KUNTZMAN 1969 (A 571) 212
 LEWEY and DRABKIN 1944 (251) 54, 52
 LEWIS and BRINK 1966 (A 418) 203
 LEWIS 1967 (A 599) 214
 LIGHTFOOT 1972 (A 176) 187
 LIKOFF, SEGAL and KASPIAN 1967 (415)
 77, 75
 LILIENTHAL 1950 (20) 10, 6
 LILIENTHAL and FUGITT 1946 (447) 83, 81
 LINCII and PFAFF 1971 (A 338) 198
 LINDERHOLM 1965 (A 36) 178
 LINDERHOLM 1969 (A 225) 191
 LINDERHOLM, SJOSTRAND and SODERSTROM
 1966 (A 37) 178
 LINDQUIST 1970 (664) 115, 167
 LINTON, ADAMS and LAWSON 1968
 (555) 101, 99
 LITMAN 1968 (A 635) 217
 LITZNER 1936 (342) 67, 66
 LIZANETS and ZARKEVICH 1971 (A 757) 226
 LOCKSHIN and BURRIS 1965 (A 600) 215
 LO COCO 1970 (A 419) 203
 LOEYER, VARAY and COTTET 1942
 (252) 54, 42
 LOGUE, ROSSE, SMITH, SALTZMAN and
 GUTTERMAN 1971 (A 226) 191
 LOMONACO 1971 (A 177) 187
 LONG 1969 (626) 112, 111
 LONGO 1970 (584) 106, 102
 LONGO, POWER and FORSTER 1969 (586)
 106, 102
 LONGO, POWER and FORSTER 1967 (585)
 106, 102
 LOPEZ-MAJANO 1971 (A 420) 203
 LORENTE, VARELA and SEIJAS 1953
 (253) 54, 52
 LUDERITZ 1971 (182) 40, 38; (A 293) 195
 LUNDEVALL 1972 (A 705) 223
 LUOMANMAKI 1966 (A 157) 186
 LUOMANMAKI and COBURN 1969 (A 158)
 186
 LUSTMAN and GEERTS 1971 (254) 54, 52
 LYNCH and MOEDE 1972 (A 227) 191
 Mac FARLAND, ROUGHTON, HALPERIN and
 NIVEN 1944 (82) 22, 21
 MACHATA 1968 (A 684) 220
 MACKINTOSH 1965 (A 512) 208
 MacQUARRIE and GIBSON 1971 (A 115)
 183
 MAENO and FEIGELSON 1968 (A 601)
 215
 MAGDALENO 1968 (A 178) 187
 MAHRLEIN 1967 (A 422) 203
 MAINARDI 1964 (255) 54, 52
 MAISELS, PATHAK, NELSON, NATHAN
 and SMITH 1971 (A 228) 191
 MALIK 1971 (A 636) 217
 MAMATSASHVILI 1970 (607) 110, 108
 MANN 1965 (541) 97, 96
 MANSLEY, STANBURY and LEMBERG 1966
 (A 116) 183
 MANTELL 1964 (587) 106
 MANTZ and TEMPE 1968 (A 825) 231
 MANTZ and TEMPE 1968 (A 826) 231
 MARANZANA 1964 (A 706) 223
 MARCELET 1907 (129) 30, 29
 MARCHIARO, MARGARIA, CAIDO and
 AQUARO 1964 (A 707) 223
 MARI and RIZZATTI 1964 (A 685) 220
 MARKIEWICZ 1966 (A 38) 178
 MARKIEWICZ 1967 (A 229) 191
 MARKIEWICZ 1970 (103) 26, 24
 MARKS and SWIECICKI 1971 (513)
 95, 93
 MARLAND and BERSAY 1972 (326) 64, 61
 MATSUYAMA 1969 (588) 106, 102
 MATTHEW 1970 (A 758) 226
 MATTHEW 1970 (A 827) 231

1005051306

- MATTHEW 1971 (A 637) 217
 MATTHEW and PROUDFOOT 1965 (A 513) 208
 MAUGH 1972 (A 193) 189
 MAUNDERLY 1972 (A 121) 203
 MAURER 1941 (343) 67, 66
 MAURER 1941 (134) 80, 79
 MAUTNER 1955 (382) 73, 69
 MAWATARIS 1970 (511) 95, 93
 MAZALESKI, COLEMAN, DUNCAN and NAU 1970 (A 573) 212
 McBay 1965 (A 686) 220
 Mc CONNELL, DEAL and OGATA 1969 (A 117) 183
 McCREMIE and JOSE 1967 (A 39) 178
 McDOWELL 1971 (339) 198
 Mc FARLAND 1952 (187) 91, 88
 McFARLAND 1970 (148) 83, 81
 McFARLAND 1971 (A 179) 187
 McFARLAND, ROUGHTON, HALPERIN and NIVEN 1944 (149) 83, 81
 McFEE, LAVINE and SULLIVAN 1970 (A 340) 198
 McGRATH and JAEGER 1971 (A 602) 215
 Mc GRATH and MOFFA 1972 (A 603) 215
 McILVAINE, NELSON and BARTLETT 1969 (50) 18, 15, (156) 34, 33
 McMILLAN and COPE 1969 (A 194) 189
 McNALLY 1931 (A 687) 220
 MEDA 1964 (A 118) 183
 MEDVEDOWSKY, SACCO and BELZUNCE 1965 (256) 54, 52
 MEIGS 1948 (52) 13, 14; (157) 34, 33
 MEIGS and RYAN 1971 (607) 110, 108
 MELANOWSKI 1963 (150) 83, 82
 MEL'NICHENKO 1968 (A 119) 183
 MENKES, SERA, ROGERS, HYDE, FORRESTER and DuBOIS 1970 (A 423) 203
 MENZ 1966 (A 688) 220
 MERLI 1969 (A 180) 187
 MESOLELLA, PERRELLA, TESTA and MORELLI 1970 (468) 86, 85
 METCALFE, MALL, BARTELS, HILPERT and PAPER 1965 (589) 106, 102
 MEYER, GROVER and WEIL 1972 (219) 49, 47
 MIHAJ and WEBER 1964 (344) 67, 66
 MIKULPA 1970 (488) 91, 89
 MILLER 1966 (A 828) 231
 MILLS and EDWARDS 1968 (220) 49, 47
 MIRANDA, KONOPINSKI and LARSEN 1967 (204) 46, 45
 MIRKIN 1966 (A 294) 195
 MISCHENKO and FRENKEL 1966 (515) 95, 93
 MITCHELL and RENZETTI 1968 (A 424) 203
 MITTMAN 1967 (A 425) 203
 MIYAGISHI and HAYASHI 1968 (517) 95, 93
 MIYAGISHI and SUWA 1969 (516) 95, 93
 MIYAHARA and TAKAHASHI 1971 (A 230) 191
 MOC, RICKARD and MOSS 1969 (A 601) 215
 MOKHOV 1967 (A 341) 198
 MOLFINO and ZANNINI 1964 (A 829) 231
 MONACO 1964 (A 708) 223
 MONAUI 1940 (296) 60, 57
 MONTGOMERY and RUBIN 1971 (A 574) 213
 MOON and RICHARDS 1972 (A 120) 183
 MOORE and FINESTONE 1968 (A 514) 208
 MORANDO and ROVIDA 1965 (183) 40, 38
 MORGANSTERN, ASH and LYNCH 1970 (A 342) 198
 MOROVIC 1968 (A 515) 208
 MORRIS 1969 (469) 86, 85
 MORRISON and HORIE 1965 (A 121) 183
 MORROW 1967 (A 258) 192
 MOSINGER, BISSCHOP and LUCCIONI 1969 (257) 54, 52
 MOSS 1969 (A 709) 223
 MOTLEY 1971 (52) 18, 15; (158) 35, 34
 MOTTA 1940 (258) 54, 52
 MOUNIER-KUHN, ROCHE, MORGAN and BERNAR 1968 (170) 86, 85
 MOUNTAIN, CASSELL, WOLTER MOUNTAIN, DIAMOND and McCARROLL 1968 (184) 4, 37
 MOUREN, POINSO, JOUGLARD, GIUDICELLIS, FRESCO and D'OMEZON 1972 (627) 112, 111
 MOUREU 1964 (185) 4, 38
 MULHAUSEN, ASTRUP and KJELDSSEN 1967 (382A) 73, 69
 MULHAUSEN, ASTRUP and MELLEMGAAARD 1968 (A 159) 186
 MULLER and HUNG 1968 (A 689) 220
 MULLER and VOIGT 1968 (416) 77, 74
 MUMPOWER, LEWIS and TOUEY 1962 (130) 31, 29
 MUROFUSCHI and MINAGAWA 1969 (A 690) 220, (A 516) 209
 MURPHY and MULCAHY 1971 (590) 106, 103
 MURPHY, LENG, ULRICH and DAVIS 1963 (A 295) 195
 MURRAY 1971 (A 122) 183

1005051307

- NAGANO 1967 (A 123) 183
 NAGEL 1937 (297) 60, 57
 NAGEL and GIBSON 1966 (A 124) 183
 NAGEL, GIBSON and HAMILTON 1971 (A 126) 183
 NAGEL, GIBSON and JENKINS 1971 (A 125) 183
 NAHUM 1965 (665) 115, 168
 NAHUM 1968 (666) 115, 169
 NAHUM 1969 (667) 115, 170
 NAIRN, POWER, HYDE, FORSTER, LAMBERTSEN and DICKSON 1965 (A 426) 203
 NAKAO 1969 (608) 110, 109
 NASH and BEEBE 1969 (628) 112, 111
 NATIONAL ACADEMY OF SCIENCES AND NATIONAL ACADEMY OF ENGINEERING 1969 (21) 10, 7
 NATIONAL CLEARINGHOUSE FOR SMOKING AND HEALTH USPHS 1964 (22) 10, 8
 NATIONAL CLEARINGHOUSE FOR SMOKING AND HEALTH USPHS 1967 (23) 10, 8; (635) 114, 117
 NATIONAL CLEARINGHOUSE FOR SMOKING AND HEALTH USPHS 1968 (24) 10, 8; (636) 114, 119
 NATIONAL CLEARINGHOUSE FOR SMOKING AND HEALTH USPHS 1969 (25) 10, 8; (637) 114, 121
 NATIONAL CLEARINGHOUSE FOR SMOKING AND HEALTH USPHS 1971 (26) 10, 8; (638) 114, 123
 NATIONAL CLEARINGHOUSE FOR SMOKING AND HEALTH USPHS 1972 (27) 10, 8; (639) 114, 128
 NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH 1972 (28) 10, 7
 NAVRATIL 1956 (345) 67, 66
 NECAS and NEUWIRT 1971 (518) 95, 93
 NEWSOME and KEITH 1965 (131) 31, 29
 NICOLAS and NICOLAS 1964 (556) 101, 99
 NIDEN and SCHULZ 1965 (221) 49, 47
 NIEBROJ 1969 (451) 83, 82
 NIELSEN 1971 (489) 91, 88, (A 759) 226
 NIELSEN 1971 (346) 67, 66
 NISHIGORI 1932 (347) 67, 66
 NISHII 1968 (A 296) 195
 NISSARDI, SANNA-RANDACCIO and SARNA 1968 (A 430) 204
 NISSARDI, SANNA-RANDACCIO, TORRAZZA and CASCIU 1965 (A 427) 204
 NISSARDI, SANNA-RANDACCIO, TORRAZZA and GARIEL 1965 (A 428) 204
 NISSARDI, TORRAZZA and ANEDDA 1967 (A 429) 204
 NIZHEGORODOV and MARCHOZKY 1969 (A 575) 213
 NOBEL and RICKER 1967 (A 40) 178
 NOBLE, BRUNORI, WYMAN and ANTONINI 1967 (A 127) 183
 NOBLE, PARKHURST and GIBSON 1970 (A 128) 184
 NORMAN, DOUGLAS and SMITH 1966 (222) 49, 48
 NORMAN and LEDINGHAM 1967 (A 760) 226
 NORMAN, MacINTYRE, SHEARER and SMITH 1970 (A 830) 231
 NOUILHAT 1964 (A 761) 226
 OBERSTEG and DELAY 1966 (691) 220
 O'DONNELL, CHIKOS and THEODORE 1971a (490) 91, 89
 O'DONNELL and MIKULKA 1970 (492) 91, 89
 O'DONNELL, MIKULKA, HEINIG and THEODORE 1971b (491) 91, 89
 OETTEL 1967 (104) 26, 24
 OGATA 1968 (A 495) 207
 OHARA 1968 (452) 83, 82
 OIRESSER, CHASSON, JOUGLARD, GOUIN, DUBOULOZ and TASSY 1968 (A 831) 231
 OKALYI 1969 (A 181) 187
 OKESON and DIVERTIE 1970 (223) 49, 47
 OKULOVSKI and HACHATUROV 1968 (A 762) 227
 OKUMA, ISHINO, SUNAMI and MOTOIKE 1968 (A 517) 209
 OKUNYEV and PROKHORENKO 1966 (519) 95, 93
 OMURA and SATO 1964 (A 576) 213
 OMURA, SATO, COOPER, ROSENTHAL and ESTABROOK 1965 (A 129) 184
 ORINIUS 1968 (259) 54
 ORIOLI and CATTANIA 1965 (542) 97, 96
 ORIZAGA and DUCHARME 1967 (383) 73, 69
 OSBORNE, ADAMEK and HOBBS 1956 (132) 31, 29
 OSKI, GOTTLIEB, MILLER and DELIVORIA-PAPADOPOULOS 1970 (A 130) 184
 OSTROWSKA 1967 (A 518) 209
 OSWALD 1966 (A519) 209
 OTIS 1970 (417) 77, 75
 OTSUKA, FUJIWARA, IKAWA and HIRAYAMA 1970 (133) 31, 29
 OTSUKI, NINOMIYA, YAMAMOTO, NAKASHIMA, SHUTARA, URAKAMI and ITAMI 1966 (A 763) 227
 OWEN and REYNOLDS 1967 (134) 31, 28
 PAEZ 1970 (A 431) 204
 PALADE, MIHAI, GOILAV and SOVAREL 1969 (A 520) 209
 PALMA-CARLOS, PALMA-CARLOS and SOARES 1964 (A 41) 178
 PALMA-CARLOS, PALMA-CARLOS and SOARES 1966 (A 231) 191
 PAPAVASLIOU, COTZIAS, DUBY, STECK, FEHLING and BELL 1972 (A 764) 227
 PARADE and FRANKE 1939 (260) 54, 51
 PARE and YEUNG 1969 (520) 95, 93
 PARIS 1964 (629) 112, 111
 PARKHURST, GERACI and GIBSON 1970 (A 132) 184

1005051308

- PARKHURST and GIBSON 1967 (A 131) 184
 PARMEGGIANI and GILARDI 1952 (53) 18, 13, 14;
 (83) 22, 21; (159) 35, 33
 PARROT, STUPFEL, ROMARY and MORDELET-
 DAMBRINE 1971 (224) 50, 47
 PASECHNIK, SHTUMM, VLADISLAVLEV and
 ZAMAYATNIN 1971 (A 133) 184
 PATTONO, MARCHIARO, CAPELLARO and
 ORIONE 1964 (A 160) 186
 PATZ 1949 (261) 55, 51
 PAULEIKOFF, MULLER-FAHBUSCH, MESTER
 and MEIBNER 1971 (A 521) 209
 PAULET and CHEVRIER 1966 (A 134) 184
 PAULET and CHEVRIER 1969 (A 765) 227
 PAULI, TRUNIGER, LARSEN and MULHAUSEN
 1968a (557) 101, 99
 PAULI, TRUNIGER, LARSEN and MULHAUSEN
 1968b (558) 101, 100
 PEARCE 1968 (A 522) 209
 PECORA 1964 (A 766) 227
 PEDRERO and RODRIGO 1964 (A 347) 198
 PERRELLI, PREVOT and SULOTTO 1970 (418)
 77, 74
 PERRELLI and ROSETTANI 1964 (A 297) 195
 PERRELLI, ROSETTANI and BRAGUZZI 1965
 (A 278) 195
 PETERSON, SIGGAARD-ANDERSEN,
 KRISTENSEN and KJELDSSEN 1968 (348) 67,
 66
 PETERSON and STEWART 1970 (A 161) 186
 PETIT, PETIT and GEILLE 1970 (A 692) 220
 PETRILLI and KANITZ 1970 (186) 41, 38, 39
 PETROVA, DALAKMANSKI and BAKALOV
 1966 (A 299) 195
 PETROVIC 1970 (419) 77, 75
 PETTER, BOURBON, MALTIER and JOST
 1971 (A 135) 184
 PETTY 1969 (A 832) 231
 PHELPS and ANTONINI 1969 (A 136) 184
 PHILIPPE and HOBBS 1956 (135) 31, 29
 PLACE 1970 (A 767) 227
 PICKWELL 1970 (A 195) 189
 PIEDELIEVRE, BRETON and DEROBERT
 1969 (591) 106, 102
 PIERCE and COLLINS 1971 (A 343) 198
 PINCHERLE and SHANKS 1967 (420) 77, 75
 PIPER, PFEIFER and SCHEID 1969 (A 433) 204
 PIPER and SIKAND 1966 (A 432) 204
 PIRNAY, DEROANNE, DUJARDIN and PETIT
 1971b (299) 60, 56
 PIRNAY, DUJARDIN, DEROANNE and PETIT
 1971a (298) 60, 56
 PIRNAY, FASSOTTE, DEROANNE and PETIT
 1968 (A 137) 184
 PIRNAY, FASSOTTE, GAZON, DEROANNE
 and PETIT 1969 (A 434) 204
 PIRNAY, PETIT and ROBERTS 1970 (A 435)
 204
 PODLESCH and STEVANOVIC 1966 (A 436) 204
 POGRUND 1969 (609) 110, 108
 POLITZER 1968 (A 138) 184
 POLLARD 1970 (A 693) 220
 PORTHEINE 1971 (105) 26, 25
 POWER 1968 (A 162) 186
 POWER, AOKI, LAWSON and GREGG 1971
 (A 438) 204
 POWER, HYDE, SEVER, HOPPIN and NAIRN
 1965 (A 437) 204
 PRELLWITZ, SCHUSTER, SCHYLLA, BAUM,
 SCHONBORN, UNGERN-STERMBERG,
 BRODERSEN and POEPLAU 1970 (421) 77, 74;
 (A 638) 217
 PREROVSKA and DRDKOVA 1967a (384) 73, 70
 PREROVSKA and DRDKOVA 1967b (385) 73, 70
 PREROVSKA and DRDKOVA 1971 (386) 73, 71
 PREZIOSI, LINDENBERG, LEVY and
 CHRISTENSON 1970 (521) 95, 93
 PROKOP and WABNITZ 1970 (453) 83, 81
 PUKHOV 1964 (610) 110, 108
 PUKHOV 1965 (A 768) 227
 PUREC and KRASNA 1967 (A 605) 215
 QUINTANA, MIRETE and GARCIA 1969 (559)
 101, 99
 RADUSHVICH 1968 (A 769) 227
 RAMSEY 1972 (84) 22, 20
 RAMSEY 1966 (A 300) 195
 RAMSEY 1967 (A 344) 198
 RAMSEY 1969 (422) 77, 75
 RAMSEY 1970 (188) 41, 37
 RAMSEY 1972 (493) 91, 89
 RAMSEY 1967 (187) 41, 38, 39
 RANDOWA 1967 (A 440) 204
 RANDOWA and SIERAWSKI 1964 (A 439) 204
 RAPOPORT 1967 (A 770) 227
 RAUSA, DIANA and PERIN 1968 (A 139) 184
 RAUSA, PERIN and DIANA 1967 (A 300) 195
 RAY and ROCKWELL 1970 (494) 91, 89
 RAY 1967 (A 606) 215
 RAYFIELD 1967 (A 301) 195
 RECKZEH and DONTENWILL 1970 (423) 77, 75
 RECKZEH, RUCKER, HARKE and DONTENWILL
 1969 (106) 26, 25
 REDDEMANN, AMENDT and JAHRIG 1970
 (A 639) 217
 REED and TROTT 1971 (A 302) 195
 REED 1970 (A 140) 184
 RIECHEL, WOBITH and ULMER 1970 (189) 41, 37
 REJSEK 1971 (A771) 227
 REMMERS and MITHOEFER 1969 (A 441) 204
 REPLOH, KLOSTERKOTTER and
 EINCK-ROSSKAMP 1966 (A 710) 223
 REVOL, MONIER, COURJON, FOURMET and
 GERIN 1966 (543) 97, 96
 REVSIN and BRODIE 1969 (A 607) 215
 RHODES 1971 (225) 50, 48
 RICCI, CAPELLARO and GAIDO 1964 (424) 77, 74
 RI 1966 (630) 112, 111
 RIKANS and VAN DYKE 1971 (A 577) 213
 RINGEL and KLAUANS 1972 (A 523) 209
 RINGOLD, GOLDSMITH, HIELWIG, FINN and
 SCHUETTE 1962 (85) 23, 19

1005051309

- RISPLER and ROSS 1965 (A 303) 195
 RITTER 1956 (300) 60, 57
 RITUCCI and LUVONI 1965 (A 694) 220
 RIZZI 1968 (A 772) 227
 ROBBINS, BORG and ROBINSON 1968 (A 345) 198
 ROBIN, RAVENS and BING 1969 (327) 65, 61
 ROBINSON and ROBBINS 1970 (A 196) 189
 ROCHE, BERTOYE, VINCENT, MOTIN, GARIN, BOLOT and CHADENSON 1968 (A 833) 231
 RODKEY 1970 (A 346) 198
 RODKEY and COLLISON 1970 (A 42) 178
 RODKEY, COLLISON and ENGEL 1969 (A 711) 223
 RODKEY, COLLISON and O'NEAL 1971 (A 43) 178; (A 182) 187
 RONDIA 1970 (A 578) 213
 RONDIA, GUYAUX and HEUSGHEM 1966 (A 304) 195
 ROOT 1962 (29) 10, 6
 ROPSHITZ and OVENSTONE 1968 (A 640) 217
 ROSE, JONES, JENKINS and SIEGEL 1970 (522) 95, 93
 ROSE 1969 (A 695) 220
 ROSE and ROSE 1971 (668) 115, 172
 ROSENBERG 1968 (86) 23, 20
 ROSENBERG 1971 (87) 23, 20
 ROSENBERG 1972 (88) 23, 20
 ROSENBLUTH 1968 (A 524) 209
 ROSENTHAL 1968 (A 696) 220
 ROSKAMM 1964 (301) 60, 56
 ROSSI-FANELLI and ANTONINI 1958 (631) 112, 111
 ROSSIN and ROBERTS 1972 (30) 10, 7
 ROSSO and DUGHERA 1964 (A 712) 223
 ROUCH, RIOUFOL and BOURBON 1971 (54) 18, 13, 15; (160) 35, 33a
 ROUGHTON 1970 (A 141) 184
 RUBINO 1964 (226) 50, 47
 RUDOLPH, BOYLE, DRESDEN and GILL 1972 (632) 112, 11
 RUEL and BARTHE 1954 (55) 18, 14; (161) 35, 33
 RUHL and LIN 1936 (56) 18, 14; (89) 23, 20, 21
 RUMEN and CHANCE 1970 (A 142) 184
 SADOKIERSKI 1965 (A 713) 223
 SAITA and LUSSANA 1971 (435) 80, 79
 SALNIS and HACHIATUROV 1970 (A 773) 227
 SANDERS and WARRINGTON 1971 (A 525) 209
 SANNA-RANDACCIO and NISSARDI 1969 (A 442) 205
 SANZHIEVA 1970 (A 608) 215
 SANZHIEVA and ZAVARZIN 1971 (A 609) 215
 SARACOGU 1951 (262) 55, 51
 SARTORELLI 1967 (A 403) 205
 SARUTA 1937 (136) 31, 29
 SASAKI, HIRANO, NAGAHAMA and USUI 1966 (544) 98, 96
 SATAKE, HIDA, TATSUBANA, YAMAZAKI and MATSUOKA 1968 (A 444) 205
 SATO 1966 (471) 86, 85
 SATOH, KIYOTANI, MINAFI and KONDO 1966 (A 697) 220
 SAVATEEV, TONKOPII and FROLOV 1970 (A 834) 231
 SAYERS and DAVENPORT 1930 (31) 10, 6
 SAYERS, YANT, LEVY and FULTON 1929 (495) 91, 88
 SCHAEFER 1964 (A 183) 187
 SCHAFFERNICHT, AIEGLER and REINHARD 1970 (A 714) 223
 SCHIECHE, KEBLER and KOBER 1970 (A 715) 223
 SCHIEVELBEIN 1968 (32) 10, 7
 SCHIEVELBEIN and EBERHARDT 1972 (328) 65, 61
 SCHLECHT 1971 (A 610) 215
 SCHMELZER, STEINER, MAYER, NEDETZKA and FASOLD 1972 (A 143) 184
 SCHMIDT 1970 (454) 83, 82
 SCHMIDT 1971 (107) 26, 25
 SCHMIDT 1939 (57) 18, 13, 14; (90) 23, 21; (162) 35, 33
 SCHMIDT 1940 (58) 18, 14; (91) 23, 21
 SCHOTT, TOMMASI, BOURRAT and MICHEL 1967 (A 526) 209
 SCHRAUZER and LEE 1970 (A 611) 215
 SCHRENK 1942 (59) 18, 13, 14
 SCHULTE 1963 (496) 92, 88
 SCHULTE 1965 (A 835) 231
 SCHUTTMANN 1968 (A 716) 223
 SCOPPETTA 1968 (592) 106
 SCORER 1971 (A 259) 192
 SEGAL 1970 (523) 95, 93
 SELING 1966 (263) 55, 52
 SELTZER 1970 (569) 115, 174
 SEMAR, TRESER and LANGE 1967 (A 348) 198
 SESSA and SANNA 1966 (A 527) 209
 SCASSELLATTI SFORZOLINI and SAVINO 1968 (137) 31, 29
 SFORZOLINI and SAVINO 1970 (A 305) 196
 SHAFER, SMILAY and MacMILLAN 1965 (264) 55, 52
 SHAW, CINKOTAI and THOMSON 1966 (A 445) 205
 SHIDA and KUROIWA 1969 (A 528) 209
 SHIELDS 1971 (92) 23, 20
 SHIMOJIMA 1970 (A 529) 209
 SHINTANI 1968 (227) 50, 48
 SHIRABE, MAWATARI and KUROIWA 1970 (A 717) 223
 SHIRAKI 1969 (A 530) 209
 SHIRUKI and TATETSU 1967 (A 531) 209
 SHOJI, YAMAMOTO, NISHIDA, ISHIKAWA, TAKADA and INOUE 1967 (A 306) 196
 SIASEV 1966 (A 698) 220
 SIEGEL and MOHLER 1969 (A 184) 188
 SIEGENTHALER 1965 (A 232) 191
 SIEGRIST 1966 (A 718) 224
 SIEVERS, EDWARDS, MURRAY and SCHRENK 1942 (60) 13, 14
 SIGGAARD-ANDERSEN, KJELDSSEN, PETERSEN and ASTRUP 1967 (387) 73, 70

1005051310

- SIGGARD- ANDERSON, PETERSEN, HANSEN
and MELLEMGAAARD 1968 (349)
67, 66
- SIGGAARD-ANDERSEN, PETERSEN, HANSEN
and MELLEMGAAARD 1969 (350) 68, 66
- SIKAND and PIPER 1966 (A446) 205
- SILVER 1971 (A 307) 196
- SILVERMAN and GARDNER 1965 (A 349) 198
- SIMONE, REGGIANI and BET 1965 (A 447) 205
- SIMPSON and RITCHIE 1968 (A 836) 231
- SIRS 1964 (A 144) 184
- SJOSTRAND 1948 (436) 80, 79
- SJOSTRAND 1970 (A 233) 191
- SLATER 1950 (302) 60, 58
- SLATER 1967 (A 350) 198
- SLUJTER 1967 (A 837) 231
- SMALL, RADFORD, FRAZIER, RODKEY and
COLLISON 1971 (A 44) 178
- SMITH 1965 (A 838) 231
- SMITH and BRANDON 1970 (A 699) 220
- SMITH, BRIERLEY and BRANDON 1971 (A 532)
209
- SMITH, BRYAN, FELESTEIN, LEVADIE,
MILLER, STEPHENS and WHITE 1970
(A 352) 199
- SMITH, BRYAN, FELDSTEIN, LEVADIE,
MILLER, STEPHENS and WHITE 1970
(A 353) 199
- SMITH, BRYAN, FELDSTEIN, LEVADIE,
MILLER, STEPHENS and WHITE 1970
(A 354) 199
- SMITH, BRYAN, FELDSTEIN, LEVADIE,
STEPHENS and WHITE 1970 (A 351) 198
- SMITH, BRYAN, FELDSTEIN, LEVADIE, MILLER
and WHITE 1972 (A 355) 199
- SMITH 1966 (A 356) 199
- SMOKING and HEALTH 1964 (634) 114, 116
- SNASHALL 1970 (A 774) 227
- SNYDER 1970 (A 533) 209
- SOBOTKA and SOBOTKA 1969 (303) 60, 57
- SOKOLOVSKY, PINCHUK and PRAVOVEROV
1967 (A 260) 192
- SOLVSTEN and KRISTJANSEN 1968 (388)
73, 69
- SPINAZZOLA, MARRACCINI, DEVOTO and
ZEDDA 1966 (A 302) 196
- SRCH 1967 (190) 41, 36, 38
- STAMM 1967 (A 357) 199
- STANKOVIC, KANTA, FOCO and ALJINOVIC
1964 (472) 86, 85
- STATHERS, HAEGER-ARONSEN, JONSSON
and MARCIC 1968 (234) 191
- STEINER, FRAYSER and ROSS 1965 (A 448)
205
- STEINER, LARSEN, DONATH and PAULI
1971 (560) 101, 100
- STEINMAN 1937 (265) 55, 51
- STENIAGEN 1959 (138) 31, 29
- STEVENS 1968 (A 185) 188
- STEWART, FISHER, HOSKO, PETERSON,
BARETTA and DODD 1972 (A 719) 224
- STEWART, PETERSON, BARETTO,
BACHAND, JOSKO and HERRMANN
1970 (497) 92, 89
- STICHNOTH and ZUMBANSEN 1970 (A 670) 220
- STOKINGER 1969 (A 261) 192
- STOKOWSKI and KESIAK 1969 (593) 106, 102
- STORMER 1938 (266) 55, 51
- STRZELCZYK and ZENK 1964 (473) 87, 85
- STUPFEL 1970 (A 236) 191
- STUPFEL and BOULEY 1970 (525) 95, 93
- STUPFEL, BOULEY, DEKOV, BOURGEOIS
and ROUSSEL 1968 (524) 95, 93
- STUPFEL, BOULEY and POLIANSKI 1970 (611)
110, 103
- STUPFEL and GODIN 1969 (A 197) 189
- STUPFEL and ROUSSEL 1968 (A 235) 191
- STURNER 1971 (A 641) 217
- SUCHCICKI 1970 (A 671) 221
- SUGIMOTO and YASUMITSU 1969 (A 839) 231
- SULOTTO, BONZANINO, MEO and RUBINO
1969 b (352) 68, 66
- SULOTTO, MEO, POLI and RUBINO 1969a
(351) 68, 66
- SUNDSTROM 1970 (A 45) 178
- SUNDSTROM 1972 (A 46) 178
- SUPFLE 1933 (A 72C) 224
- SUPFLE 1934 (353) 68, 66
- SUZUKI 1969 (304) 60, 57
- SWINNERTON 1971 (A 200) 189
- SWINNERTON, LINNENBOM and LAMONTAGNE
1970 (A 199) 189
- SWINNERTON, LINNENBOM and LAMONTAGNE
1970 (A 198) 189
- SZADKOWSKI, MASTALL, SCHALLER and
LEHNERT 1970 (191) 41, 38
- SZILAGYI 1967 (594) 106, 102
- SZLIWOWSKI and KLEES-DELANGE
1970 (455) 83, 81
- SZOLLOSI, MEDVE and JENEY 1970 (329)
65, 61
- SZUCHOVSKY, KENYERES and HARSANYI
1969 (A 642) 217
- TABER and MORRISON 1964 (A 612) 215
- TACCOLA, JEDRYCHOWSKI and CAVALLERI
1965 (456) 84, 81
- TAKAHATA and MIYAGISHI 1969 (527)
95, 98
- TAKAMATSU, TAKEICHI and YUKITAKE
1969 (A 534) 209
- TAKEYA, TAKANO, TAMURA, HOJO,
YOSIDA and HURUKAWA 1970 (A 840) 232
- TANAKA 1967 (595) 106, 102
- TANIEWSKI and KUGLER 1964 A (474)
87, 85
- TANIEWSKI and KUGLER 1964 B (475) 87, 85
- TARTULIER, TOURNAIRE, DEYRIEUX and
BLUM 1967 (A 449) 205
- TATEGAMI 1968 (A 775) 227
- TATETSU, HARADA, NAKAMURA,
KASAGI, ISIKAWA and KAMANO 1968
(547) 98, 96

1005051311

- TATETSU, KIYOTA, TOYA, TEROKA,
FUJITA, INQUE, MIMURA, HARADA,
TAKAGI, YAMAGATA, KOZUMA,
MIYAGAWA, TOMONARI, TERAOKA,
MURAYAMA, YASUOKA, MIYOSHI and
KASAGI 1967 (A 545) 98, 96
- TATETSU, TOYA, FUJITA, INQUE,
HARADA, TOMONARI, MURAYAMA
YASUOKA, MIYOSHI and KASAGI 1967b
-98, 96
- TATETSU, TOYA, MIMURA, HARADA and
TSUKAYAMA 1969 (A 721) 224
- TAYLOR and MILLER 1965 (A 48) 178
- TEBBENS and SPEAR 1971 (A 722) 224
- TEICHER 1967 (528) 95, 93
- TEMMERMAN and ETIENNE 1969 (A 841)
232
- THEODORE, O'DONNELL and BACK 1971
(425) 78, 75; (33) 10, 6
- THIELS, DURME, VERMEIRE and
PANNIER 1972 (267) 55, 52
- THOMAS and PEARSE 1964 (528a) 95, 93
- THOMSON 1971 (A 672) 221
- THURSTON 1968 (A 723) 224
- THURSTON 1968 (A 842) 232
- THURSTON 1970 (A 776) 227
- THURSTON 1971 (A 843) 232
- TIBBLIN 1971 (330) 65, 61
- TIBBLING 1969 (476) 87, 85
- TIMMONS 1970 (A 613) 215
- TKACHENKO, TISHCHENKO, ZATSEPIN
and DIMITROVA 1966 (426) 78, 74
- TLUSTY, HLOUSKOVA, KROFTA and DAUM
1972 (A 540) 205
- TOKANA 1971 (A 47) 178
- TOMASINI 1967 (A 535) 210
- TOMONARI 1968 (548) 98, 96
- TONOMURA, YAMATE and TSUJI 1967
(A 262) 193
- TORELLI 1964 (A 777) 227
- TOTH 1907 (139) 31, 29
- TOTSUKA, MORO, HORIE and YZAKI 1971
(549) 98, 96; (A 673) 221
- TOWNSEND and STETSON 1968 (A 778) 227
- TOYA 1967 (A 674) 221
- TOYAMA 1968 (A 263) 193
- TRAKHTENBERG 1966 (A 675) 221
- TRILLET, GIRARD and BOULETTEAU 1970
(A 536) 210
- TRINDER and HARPER 1962 (61) 18, 15;
(163) 35, 33
- TRINQUET, CLAUZEL, CARRE and
MEYER 1967 (A 451) 205
- TRINQUET and MEYER 1971 (199) 44, 43
- TROMPEO, TURLETTI and GIARRUSO
1964 (A 309) 196
- TRONZANO and COSCIA 1964 (A 537) 210
- TROUTON and EYSENCK 1961 (197 A) 92, 88
- TRUDINGER 1970 (A 614) 215
- TRUHAUT, BOUDENE and CLAUDE 1965
(612) 110, 108
- TRUHAUT, BOUDENE and CLAUDE 1967
(A 163) 186
- TRUHAUT, BOUDENE and CLAUDE 1968
(389) 73, 70
- TRUHAUT, BOUDENE and CLAUDE 1968
(427) 78, 75
- TRUHAUT, BOUDENE, CLAUDE, JACOTOT
1968 (354) 66, 66
- TUTT 1970 (A 676) 221
- TZAGOLOFF 1965 (A 145) 184
- UBISCH and WESTERLUND 1971 (A 314) 196
- UMEZAWA 1968 (A 310) 196
- VALIC and DURIC 1954 (62) 18, 14; 164,
35, 33
- VANDENBERGH, BILLIET, WOESTIJNE
and GYSELEN 1968 (A 452) 205
- VAN LIEW 1968 (356) 68, 66
- VAN LIEW 1968 (355) 68, 66
- VAN LIEW 1970 (357) 68, 66
- VANNESTE 1966 (A 358) 199
- VANROUX and GREGOIRE 1964 (A 453) 205
- VAN VUGT 1968 (428) 78, 74
- VARESE and SORANZO 1968 (A 643) 217
- VAUGHAN, JENNELLE and LEWIS 1969
(228) 50, 48
- VEIL 1968 (A 311) 196
- VEITH 1940 (305) 60, 58
- VENGERSKAIA, NAZOROV, BOBROVA
SUBROVSKY and DUMKO 1968 (A724224
- VENNESLAND and JETSMANN 1971
(A 615) 215
- VICH 1969 (A 677) 221
- VIDAL and PICARD 1967 (A 538) 210
- VIEWEG, GRUNEWALD and ZIEGLER 1970
(A 644) 217
- VIOLET and PERROT 1967 (A 678) 221
- VIVOLI and PREITE 1966 (A 679) 221
- VOGEL 1968 (A 645) 217
- VOGEL, WHEELER and WHITTEN 1972 (307)
60, 56
- VOGEL and GLESER 1972 (306) 60, 56
- VON BERGMANN 1934 (268) 55, 52
- VON OETTINGEN, DONAHUE and VALAER
1941 (358) 68, 66
- VOORHOEVE, REMEIK, FREELAND and
MATTHIAS 1972 (A 312) 196
- VORONCHUCK 1966 (A 680) 221
- VOROSMARTI, BRADLEY, LINAWEAVER,
KLECKNER and ARMSTRONG 1970 (A 186)
188
- VUIA 1967 (A 539) 210
- VUOPALA, HUHTI, TAKKUNEN and HUIKKO
1970 (A 725) 224
- VYSKOCIL 1956 (359) 68, 66
- WAGNER 1964 (A 726) 224
- WAGNER and RICHTER 1968 (A 779) 227
- WAGNER, MAZZONE and WEST 1971 (A 451)
205
- WAGNER, LATHAM, BRINKMAN and FILLEY
1969 (A 455) 205
- WAHL 1899 (110) 31, 27
- WAJGT 1971 (437) 80, 79

1005051312

- WALD and FENTON 1972 (A 49) 178
WALTZ and HAUSERMANN 1965 (141) 31, 28
WANSTUUP, KJELDSEN and ASTRUP 1969 (390) 73, 70
WARBURG, GEISLER and LORENZ 1967 (A 579) 213
WATARI 1969 (A 780) 227
WATANABE, KITAGUCHI, KIYOFUJI, MORISAKI, MASUDA, NOGUCHI and MATSUMOTO 1970 (A 681) 221
WATSON 1968 (A 682) 221
WAYLAND and MOHAJER 1971 (A 616) 215
WEASE 1967 (A 359) 199
WEATHERBURN and LOGAN 1969 (A 50) 178
WEAVER 1971 (A 313) 196
WEBER, MORET and CHIAUVET 1967 (A 456) 205
WEDERKINCH 1964 (A 51) 178
WEIGT 1967 (A 683) 221
WEINSTOCK 1969 (A 201) 189
WEINSTOCK and NIKI 1972 (A 202) 189
WEISKOPF and SEVERINGHAUS 1972 (A 457) 205
WEISS, SLAWSKY and DESFORGES 1971 (63) 18, 15; (165) 35, 34
WENDER 1963 (A 540) 210
WENDT 1941 (269) 55, 51
WENNELLAND 1945 (64) 18, 14
WERNITSCH 1969 (A 844) 232
WESTBERG and COHEN 1971 (A 203) 189
WHARTON 1964 (A 146) 185
WHEREAT 1970 (391) 73, 70
WHITE 1970 (A 238) 191
WHITE, COBURN, WILLIAMS, GOLDWEIN, ROTHFR and SHAFFER 1967 (A 237) 191
WHITEHEAD and WORTHINGTON 1961 (93) 23; (166) 35, 33
WHO CHRONICLE 1971 (A 268) 193
WHO EXPERT COMMITTEE 1963 (A 264) 193
WHO EXPERT COMMITTEE 1964 (A 265) 193
WHO EXPERT COMMITTEE 1969 (A 267) 193
WHO SCIENTIFIC GROUP 1968 (A 266) 193
WIECZOREK 1968 (A 52) 178
WIETHAUP 1968 (A 315) 196
WIJDEVELD 1968 (561) 101, 99
WIKTOR 1954 (331) 65, 63
WILLIAMS 1964 (192) 41, 37
WILSON, RICH and MESSMA 1972 (A 684) 221
WILSON and HARDING 1970 (613) 110, 108
WILSON, NELSON and HARDING 1965 (A 580) 213
WINTER and SHATIN 1970 (A 845) 232
WINTERHALTER, AMICONI and ANTONINI 1968 (A 147) 185
WITTENBERG, ANTONINI, BRUNORI, NOBLE WITTENBERG and WYMAN 1967 (A 148) 185
WITTENBERG, BRUNORI, ANTONINI, WITTENBERG and WYMAN 1965 (633) 112, 111
WITTGENS 1966 (614) 110, 108
WITUSIK 1971 (A 541) 210
WOHLERS, NEWSTEIN and DAUNIS 1967 (A 727) 224
WOHLRAB and OGUNMOLA 1971 (A 581) 213
WOJAHN 1967 (A 53) 179
WOJCZUK and CHYLAK 1971 (562) 101, 99
WOLFGANG 1970 (A 204) 189
WOLKONSKY 1969 (A 269) 193; (A 458) 205
WOODRUFF 1970 (A 316) 196
WOOLF 1964 (A 459) 205
WRANNE 1967 (A 164) 186
WRANNE 1967 (A239) 191
WRANNE 1969 (A 149) 185
WYNDER and HOFFMANN 1967 (34) 10, 7
XINTARAS, JOHNSON, ULRICH, TERRILL and SOBECKI 1966 (A 360) 199
YACOB, FAURE, MALLON and CAU 1970 (65) 18, 13, 15; (167) 35, 34
YAGLOU 1955 (108) 26, 24
YAMATE and MATSUMURA 1968 (206) 46, 45
YAMATE and MATSUMURA 1971 (A 317) 196
YAMAZAKI, OSHISHI and YAMAZAKI 1970 (A 150) 185
YASUKOCHI and YASUOKA 1967 (A 542) 210
YASUOKA 1970 (550) 98, 96
YOUNG and PUGH 1963 1963 (598) 107, 104
YOUNOSZAI, KACIC and HAWORTH 1968 (596) 106, 104
YOUNOSZAI, PELOSO and HAWORTH 1969 (597) 107, 103
YUKITAKE 1970 (A 543) 210
ZAFFIRI 1964 (A 781) 228
ZAFFIRI, CALA, CENTI and SALICONE 1971 (A 782) 228
ZANARDI, VILLA and MONTI 1964 (270) 55, 52
ZARIVAISKALA 1966 (A 728) 224
ZEI 1960 (332) 65, 63
ZENK 1964 (477) 87, 85
ZENK 1965 (478) 87, 85
ZIBEROV 1966 (A 783) 228
ZIEGLER 1936 (308) 60, 56
ZOLOTUKHIN 1968 (457) 84, 81
ZORN 1964 (A 685) 221
ZORN 1968 (A 846) 232
ZORN 1969 (A 54) 179

1005051313

1005051314

